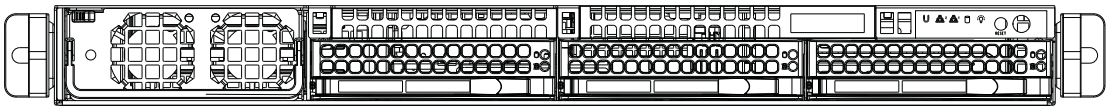
SUPERMICRO®

SUPERSERVER 6016XT-TF
SUPERSERVER 6016GT-TF
SUPERSERVER 6016GT-TF-TM2
SUPERSERVER 6016GT-TF-TC2



USER'S MANUAL

Revision 1.0a

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6016XT-TF/6016GT-TF/6016GT-TF-TM2/6016GT-TF-TC2. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 6016XT-TF/6016GT-TF/6016GT-TF-TM2/6016GT-TF-TC2 is based on the SC818GTQ-1400B 1U rackmount server chassis and the Super X8DTG-DF serverboard. Please refer to our web site for an up-to-date list of supported operating systems, processors and memory.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the Super X8DTG-DF serverboard and the SC818GTQ-1400B chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the system into a rack and check out the server configuration prior to powering up the system. If your server was ordered without the processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the system.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X8DTG-DF serverboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC818GTQ-1400B 1U rackmount server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring Serial ATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS Eror Beep Codes

Appendix B: Installing Windows

Appendix C: System Specifications

Notes

Table of Contents

Chapter 1 Introduction

1-1 Overview 1-1
1-2 Serverboard Features 1-2
Processors 1-2
Memory 1-2
Serial ATA 1-2
PCI Expansion Slots 1-2
Onboard Controllers/Ports 1-2
IPMI 1-3
Other Features 1-3
1-3 Server Chassis Features 1-3
System Power 1-3
SATA Subsystem 1-3
Front Control Panel 1-3
Cooling System 1-3
1-4 GPU Subsystem 1-4
1-5 Contacting Supermicro 1-6

Chapter 2 Server Installation

2-1 Overview 2-1
2-2 Unpacking the System 2-1
2-3 Preparing for Setup 2-1
Choosing a Setup Location 2-1
Rack Precautions 2-2
Server Precautions 2-2
Rack Mounting Considerations 2-3
Ambient Operating Temperature 2-3
Reduced Airflow 2-3
Mechanical Loading 2-3
Circuit Overloading 2-3
Reliable Ground 2-3
2-4 Installing the System into a Rack 2-4
Identifying the Sections of the Rack Rails 2-4
Installing the Inner Rail Extensions 2-5
Assembling the Outer Rails 2-6
Installing the Outer Rails onto the Rack 2-7
Installing the Server into a Telco Rack 2-9

2-5 Checking the Serverboard Setup 2-10
2-6 Checking the Drive Bay Setup 2-11

Chapter 3 System Interface

3-1 Overview 3-1
3-2 Control Panel Buttons 3-1
Reset 3-1
Power 3-1
3-3 Control Panel LEDs 3-2
Universal Information LED 3-2
NIC2 3-2
NIC1 3-3
HDD 3-3
Power 3-3
3-4 SATA Drive Carrier LEDs 3-3

Chapter 4 System Safety

4-1 Electrical Safety Precautions 4-1
4-2 General Safety Precautions 4-2
4-3 ESD Precautions 4-3
4-4 Operating Precautions 4-4

Chapter 5 Advanced Serverboard Setup

5-1 Handling the Serverboard 5-1
Precautions 5-1
Unpacking 5-2
5-2 Serverboard Installation 5-2
5-3 Connecting Cables 5-3
Connecting Data Cables 5-3
Connecting Power Cables 5-3
Connecting the Control Panel 5-3
5-4 I/O Ports 5-4
5-5 Installing the Processor and Heatsink 5-5
Installing an LGA1366 Processor 5-5
Installing a CPU Heatsink 5-7
Memory Support 5-8
5-6 Adding PCI Add-On Cards 5-10
5-7 Serverboard Details 5-11
X8DTG-DF Quick Reference 5-12
5-8 Connector Definitions 5-13
5-9 Jumper Settings 5-19

5-10 Onboard Indicators 5-21
5-11 SATA Ports 5-22
5-12 Installing Software 5-23
Supero Doctor III 5-24

Chapter 6 Advanced Chassis Setup

6-1 Static-Sensitive Devices 6-1
Precautions 6-1
6-2 Control Panel 6-2
6-3 System Cooling 6-2
System Fan Failure 6-3
6-4 Drive Bay Installation/Removal 6-4
Accessing the Drive Bays 6-4
Peripheral Drive Installation 6-7
6-5 Installing the Air Shroud 6-8
Checking the Air Flow 6-8
6-6 Power Supply 6-9
Power Supply Failure 6-9

Chapter 7 BIOS

7-1 Introduction 7-1
Starting BIOS Setup Utility 7-1
How To Change the Configuration Data 7-1
Starting the Setup Utility 7-2
7-2 Main Setup 7-2
7-3 Advanced Setup Configurations 7-4
7-4 Security Settings 7-25
7-5 Boot Configuration 7-26
7-6 Exit Options 7-27

Appendix A BIOS Error Beep Codes

Appendix B Installing Windows

Appendix C System Specifications

Chapter 1

Introduction

1-1 Overview

The SuperServer 6016XT-TF/6016GT-TF/6016GT-TF-TM2/6016GT-TF-TC2 is a GPU-optimized supercomputing server comprised of two main subsystems: the SC818GTQ-1400B 1U server chassis and the X8DTG-DF serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

- Six 4-cm, hot-swap counter-rotating fans (FAN-0102L4)
- Two 4-cm, hot-swap counter-rotating fans (FAN-0087L4)
- One air shroud (MCP-310-81802-0B)
- Two passive CPU heatsinks (SNK-P0037P)
- Riser Cards, 6016XT-TF:
  One RSC-R1UG-2E8 for two PCI-Express x8 cards, left side
  One RSC-R1UG-2E8R for two PCI-Express x8 cards, right side
  One RSC-R1U-E16R for PCI-Express x16 card, right side
- Riser Cards, 6016GT Series:
  One RSC-R1UG-E16 for PCI-Express x16 card, left side
  One RSC-R1UG-E16R for PCI-Express x16 card, right side
  One RSC-R1U-E16R for PCI-Express x16 card, right side
- Two power cables for GPU cards, 6016GT series only (CBL-0333L)
- SATA Accessories
  One SATA backplane (BPN-SAS-818TQ)
  Three 35-cm SATA cables (CBL-0315L)
  Three hot-swap drive carriers (MCP-220-00001-01)
  One SGPIO cable (CBL-0157L)
- One rail set (MCP-290-00020-N)
- One Super Server 6016XT-TF/6016GT Series User's Manual

1-2 Serverboard Features

At the heart of the SuperServer 6016XT-TF/6016GT-TF/6016GT-TF-TM2/6016GT-TF-TC2 lies the X8DTG-DF, a dual processor serverboard based on the Intel 5520 chipset. Below are the main features of the X8DTG-DF. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X8DTG-DF supports two Intel Xeon processor 5600/5500 series. Please refer to the serverboard description pages on our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X8DTG-DF has 12 DIMM slots that can support up to 192 GB of registered ECC DDR3-1333/1066/800 SDRAM or up to 48 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 MHz SDRAM. Modules of the same size and speed are recommended. See Chapter 5 for details.

Serial ATA

A SATA controller is integrated into the South Bridge (ICHR10) section of the chipset to provide a six-port 3/Gbs SATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units.

Note: The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the SATA drives.

PCI Expansion Slots

The X8DTG-DF has two PCI-Express 2.0 x16 slots and one PCI-Express 2.0 x4 slot. The 6016GT-TF-TM2 and 6016GT-TF-TC2 (and the 6016GT-TF if GPUs are installed) can accommodate one low-profile PCI-E x4 card with a riser card in a x16 slot. The 6016XT-TF without GPUs installed can support four full size PCI-E x8 cards in the x16 slots and (with a riser card) one low-profile PCI-E x4 card in a x16 slot.

Onboard Controllers/Ports

The color-coded I/O ports include one COM port (an additional COM header is located on the serverboard), a VGA (monitor) port, two USB 2.0 ports, PS/2 mouse and keyboard ports and two Gb Ethernet ports.

IPMI

IPMI (Intelligent Platform Management Interface) is a hardware-level interface specification that provides remote access, monitoring and administration for Supermicro server platforms. IPMI allows server administrators to view a server's hardware status remotely, receive an alarm automatically if a failure occurs, and power cycle a system that is non-responsive.

Other Features

Other onboard features that promote system health include onboard voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

1-3 Server Chassis Features

System Power

The SC818GTQ-1400B features a Gold Level 1400W high-efficiency power supply. The AC power cord should be removed from the system before servicing or replacing the power supply. See Chapter 6 for details.

SATA Subsystem

The SC818GTQ-1400B chassis includes three 3.5" drive bays, which may be used to house hot-swappable SATA drives. RAID 0, 1, 5 and 10 are supported (RAID 5 is not supported with Linux OS).

Front Control Panel

The control panel provides a system monitoring and control interface. LEDs indicate system power, HDD activity, network activity, system overheat, UID and power supply failure. A main power button and a system reset button are also included.

Cooling System

The SC818GTQ-1400B has an innovative cooling design that includes four 4-cm counter-rotating PWM (Pulse Width Modulated) fans located in the middle section of the chassis. Two additional fans are included to cool each GPU in the 6016GT series servers. The power supply module also includes a cooling fan. All chassis and power supply fans operate continuously. An air shroud channels the airflow from the system fans to efficiently cool the processors and memory. See note on the following page regarding fan control.

1-4 GPU Subsystem

The 6016GT family of servers represents Supermicro's line of massively parallel processing dual-GPU servers. Two NVIDIA® Tesla™ GPUs with multiple x16 non-blocking native Gen2 PCI-Express connectivity place these systems at the forefront of today's GPU computing solutions.

See the table below for the GPU specifications of each server. Refer to the NVIDIA web site (www.nvidia.com) for details on Tesla GPUs.

GPU Specifications	
Server Model	**GPU Subsystem**
6016XT-TF	Riser cards included for PCI expansion (see note below)
6016GT-TF	2x Gen 2.0 PCI-E x16 slots for double-width GPUs (GPUs not included)
6016GT-TF-TM2	2x Nvidia Tesla M1060 GPUs (preinstalled)
6016GT-TF-TC2	2x Nvidia Tesla C1060 GPUs (preinstalled)

Notes

The GPUs process complex image calculations and then route the data out through the VGA port on the serverboard.

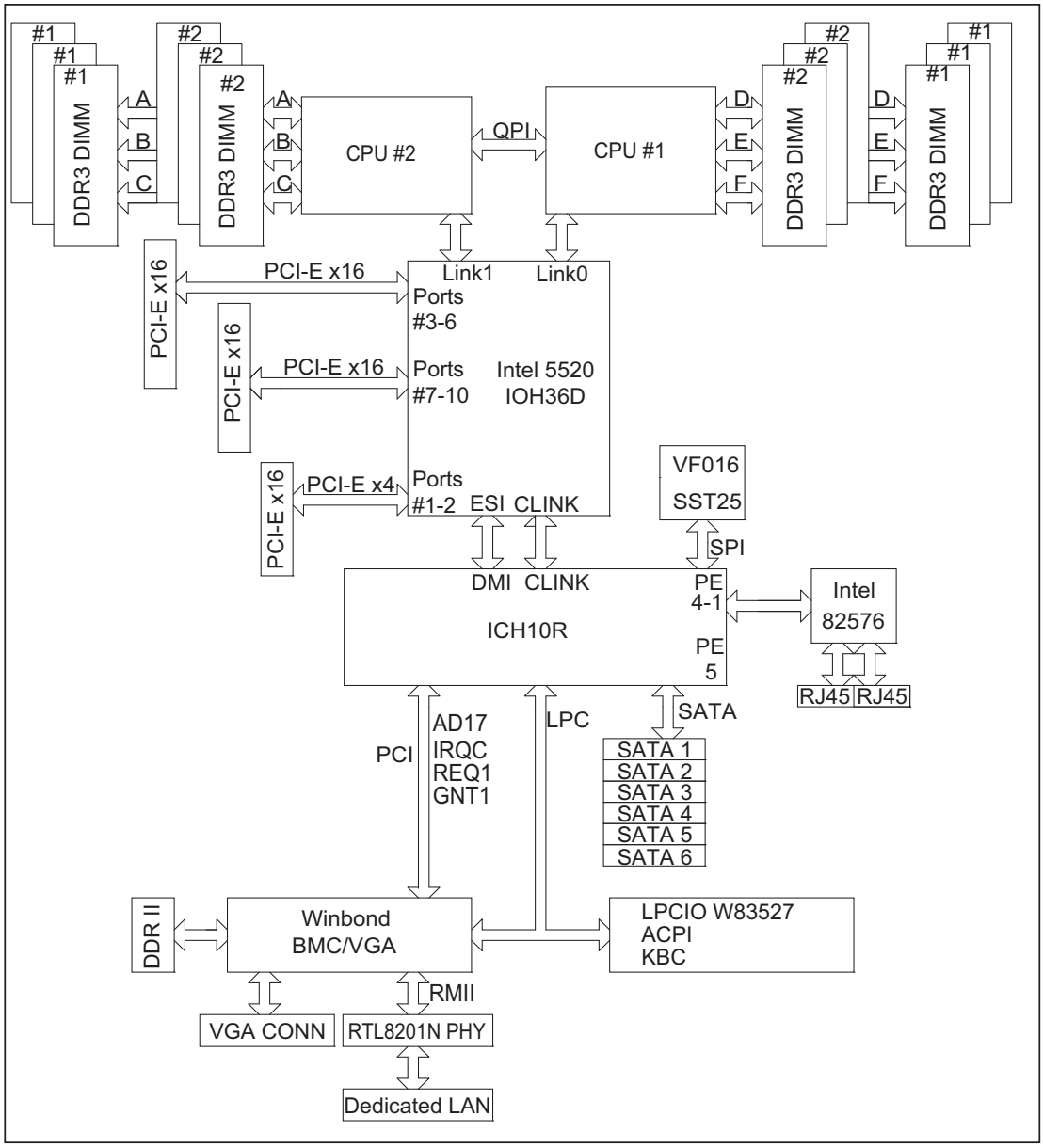
The 6016XT-TF can support a single standard size (single-width) GPU only.

The C1060 GPU model includes an active heatsink. Its fans work independently of the system fans and cooling parameters.

The M1060 model comes with a passive heatsink. Cooling the GPU is a function of overall system cooling.

Figure 1-1. Intel 5520 Chipset:
System Block Diagram

Note: This is a general block diagram. Please see Chapter 5 for details.



1-5 Contacting Supermicro

Headquarters

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Fax:	+886-(2) 8226-3991
Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	886-2-8228-1366, ext.132 or 139

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the system was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the server. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the server was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.
- Rack-mounted equipment should not be used as a shelf or work space.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SATA drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

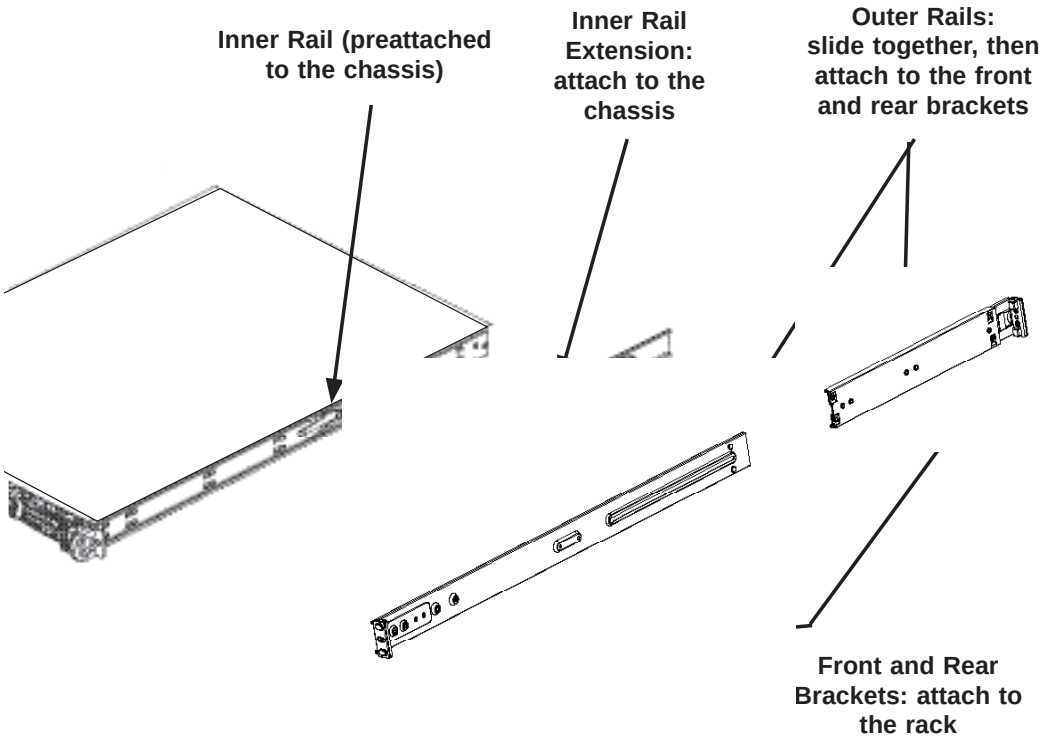
This section provides information on installing the SC818G chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly. You should also refer to the installation instructions that came with the rack unit you are using.

Note: This rail will fit a rack between 26" and 33.5" deep.

Identifying the Sections of the Rack Rails

The chassis package includes two rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

Figure 2-1. Identifying the Sections of the Rack Rails


Inner Rail (preattached to the chassis)
Inner Rail Extension: attach to the chassis
Outer Rails: slide together, then attach to the front and rear brackets
Front and Rear Brackets: attach to the rack

Installing the Inner Rail Extensions

The SC818G chassis includes a set of inner rack rails in two sections: inner rails (A) and inner rail extensions (B). The inner rails are preattached and do not interfere with normal use of the chassis if you decide not to install to a server rack. Attaching the inner rail extensions to to the inner rails stabilizes the chassis within the rack.

Installing the Inner Rail Extensions

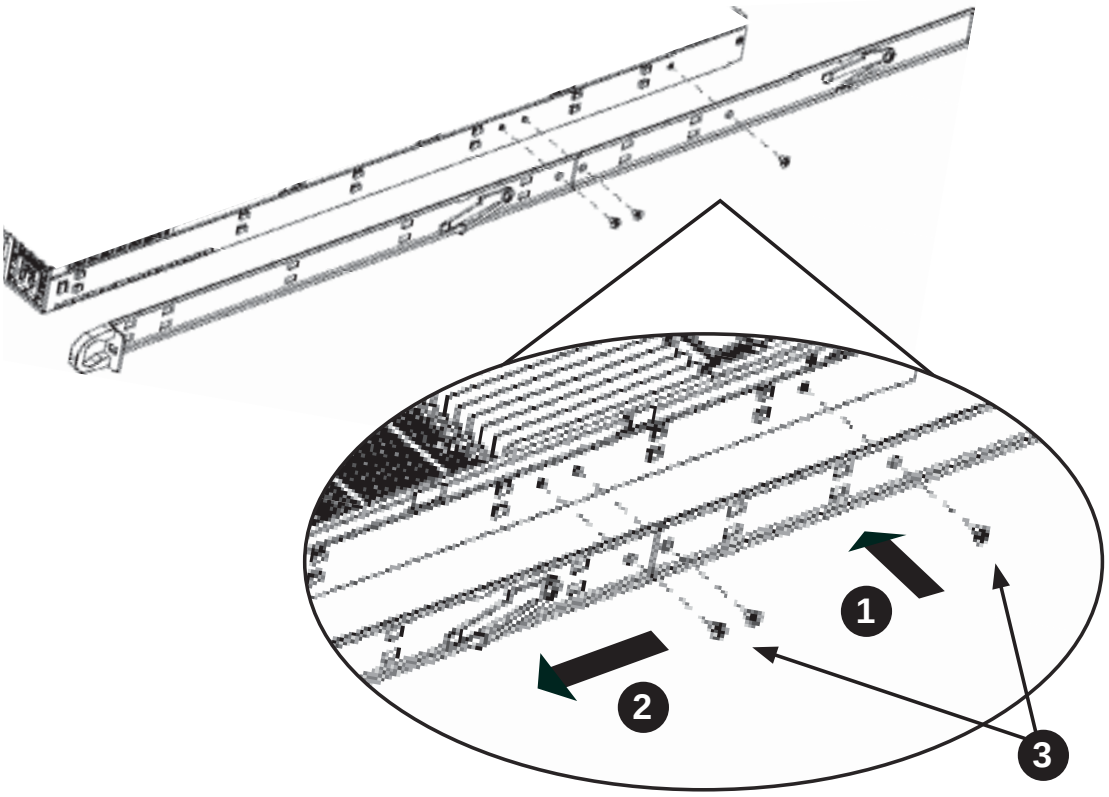
1. Place the inner rail extensions (B) over the preattached inner rails (A) which are attached to the side of the chassis. Align the hooks of the inner rail with the rail extension holes. Make sure the extension faces "outward" just like the inner rail.

2. Slide the extension toward the front of the chassis.

3. Secure the chassis with screws as illustrated.

4. Repeat steps 1-3 for the other inner rail extension.

Figure 2-2. Installing the Inner Rails



Assembling the Outer Rails

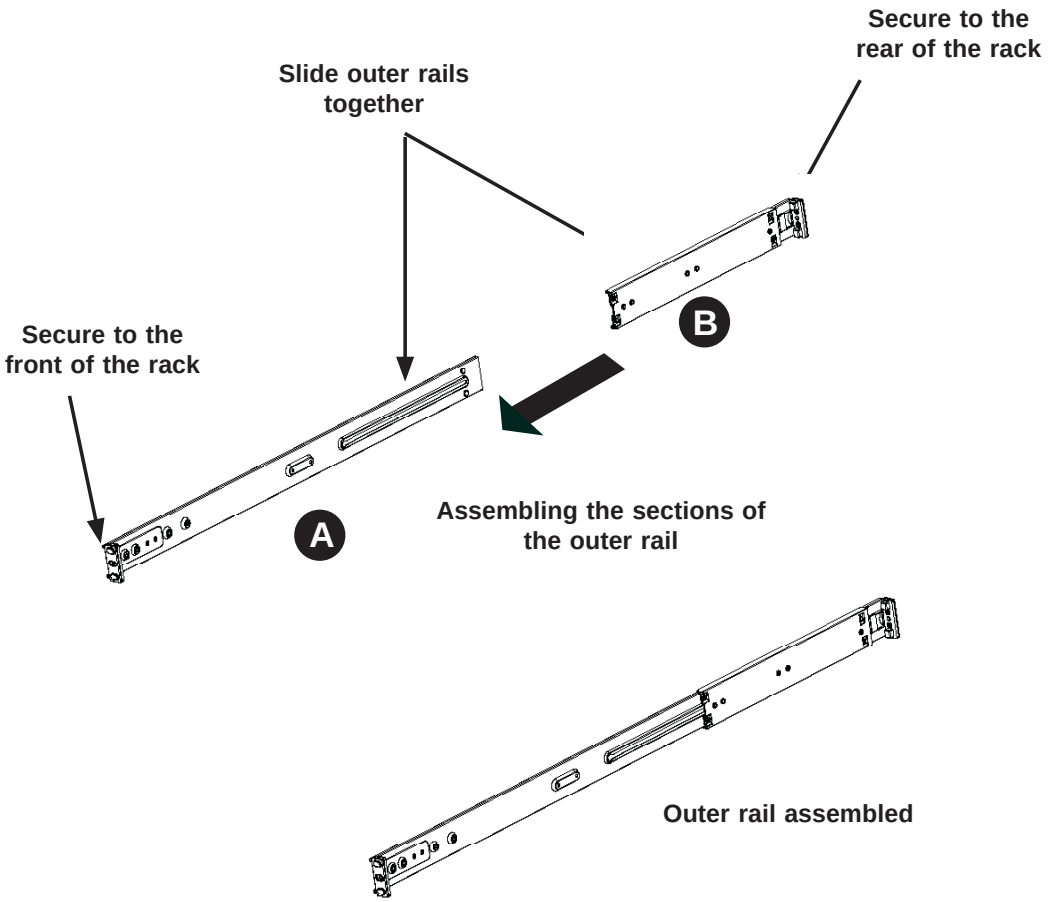
Each outer rail is in two sections that must be assembled before mounting on to the rack.

Assembling the Outer Rails

1. Identify the left and right outer rails by examining the ends, which bend outward.

2. Slide the front section of the outer rail (A), into the rear section of the outer rail (B).

Figure 2-3. Assembling the Outer Rails


Secure to the rear of the rack
Slide outer rails together
B
Secure to the front of the rack
A
Assembling the sections of the outer rail
Outer rail assembled

Installing the Outer Rails onto the Rack

Outer Rail Installation

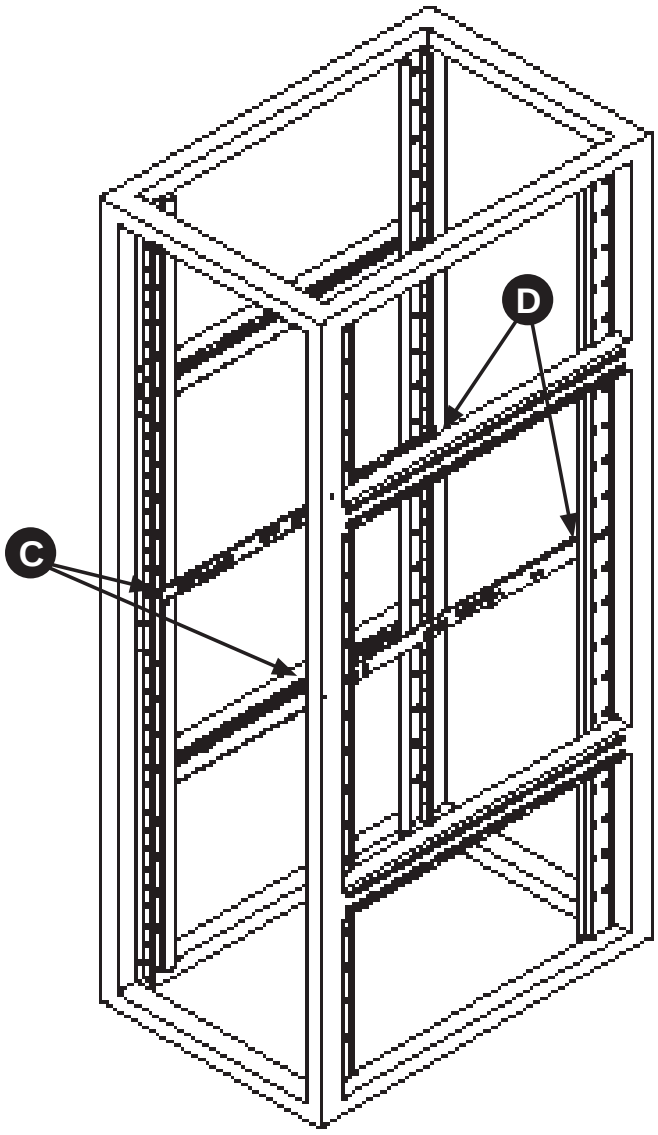
1. Adjust the outer rails to the proper length so that the outer rail fits snugly within the rack.

2. Align the holes on the front of the outer rail, with the holes on the front of the rack (C) and secure with the screws provided.

3. Align the holes on the rear of the outer rail to the holes on the rack (D) and secure with the screws provided.

4. Repeat the procedure with the second outer rail assembly.

Figure 2-4. Installing the Outer Rails to the Rack



Installing the Chassis into a Rack (Figure 2-5)

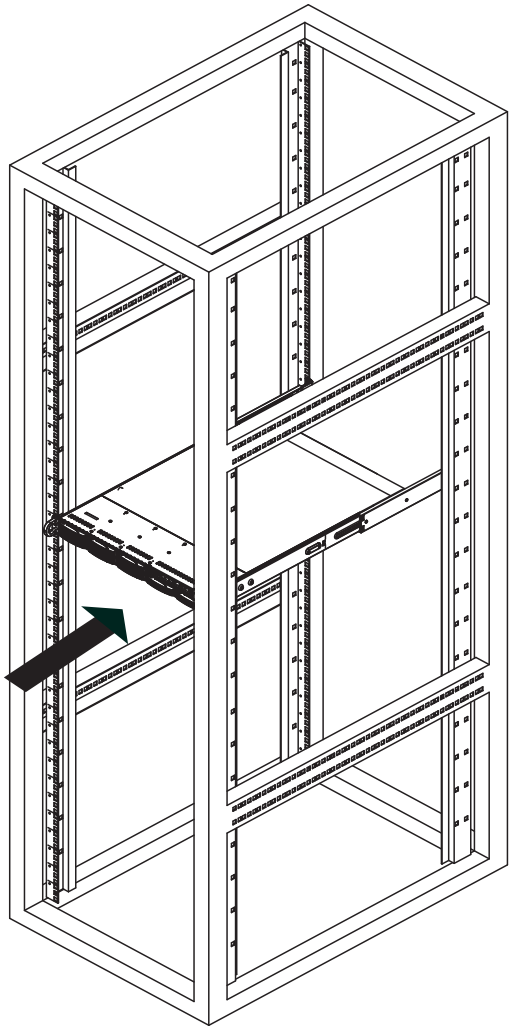
1. Confirm that chassis includes the inner rails and rail extensions . Also, confirm that the outer rails are installed on the rack.

2. Line chassis rails with the front of the rack rails.

3. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the server has been pushed completely into the rack, you should hear the locking tabs "click".

4. (Optional) Insert and tightening the thumbscrews that hold the front of the server to the rack.

Figure 2-5. Installing the Server into a Rack

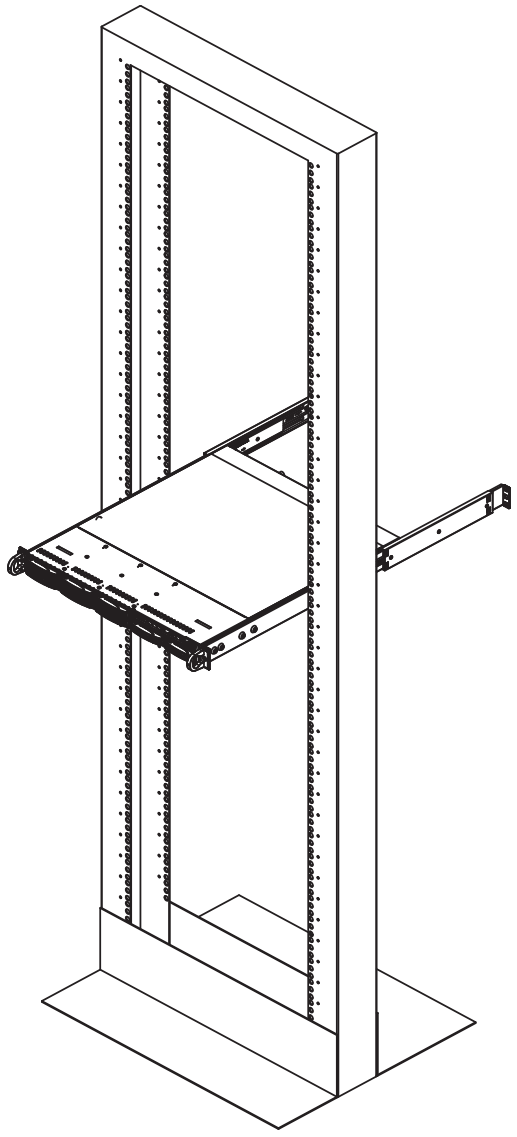


Installing the Server into a Telco Rack

Optional brackets (p/n MCP-290-00016-0N) are needed to install the server to a telco (open type) rack.

To install the server into a Telco type rack, use the two L-shaped brackets on either side of the chassis (four total). First, determine how far follow the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

Figure 2-6. Installing the Server into a Telco Rack



2-5 Checking the Serverboard Setup

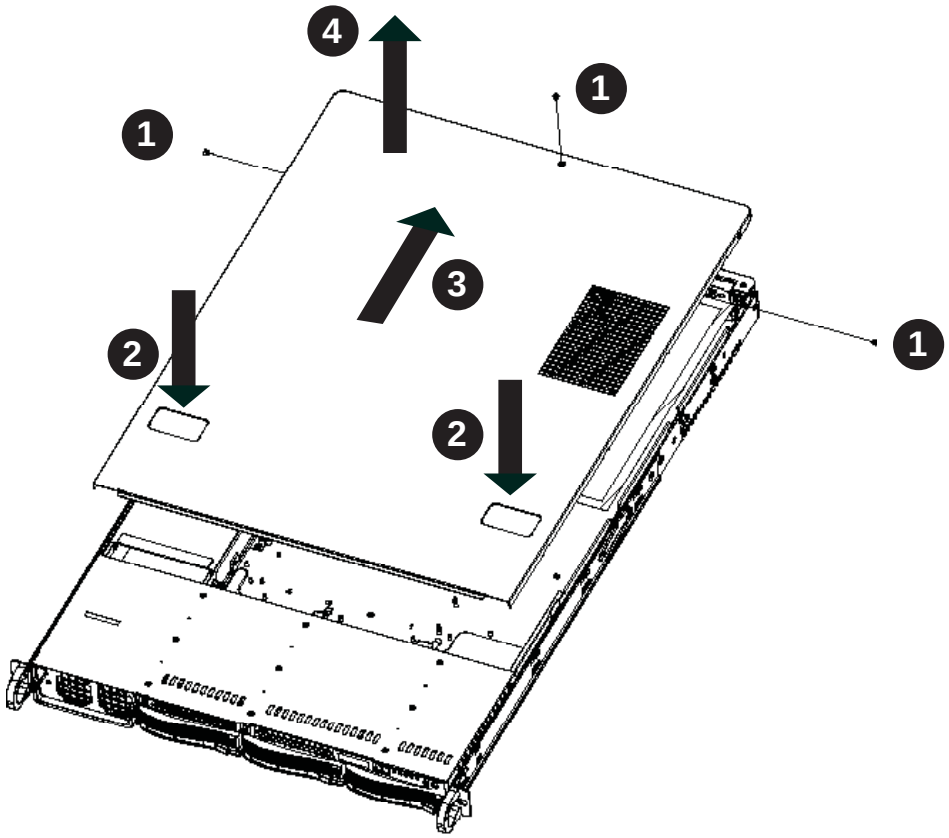
After you install the server in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

Removing the Chassis Cover (Figure 2-7)

1. Remove the three screws securing the top cover to the chassis.
2. Press both of the release tabs at the same time to release the cover
3. Slide the cover toward the rear of the chassis.
4. Lift the cover up and off of the chassis.

Warning: Except for short periods of time, do NOT operate the server without the cover in place. The chassis cover must be in place to allow proper airflow and prevent overheating.

Figure 2-7: Removing the Chassis Cover



Checking the Components

1. You may have processors already installed to the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

2. Your server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the serverboard area of the chassis.

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the hard drives have been properly installed and all connections have been made.

Checking the Drives

1. For servicing the hard drives, you will need to remove the top chassis cover.

2. If you need to remove or install hard drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by 4-cm counter-rotating fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Providing Power

1. The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).

2. Finish by depressing the power button on the chassis control panel.

Chapter 3

System Interface

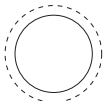
3-1 Overview

There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel and an on/off switch on the power supply. This chapter explains the meanings of all LED indicators and the appropriate response you may need to take.

3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis: a reset button and a power on/off button.

RESET



Reset

Use the reset button to reboot the system.

Power

The main power button is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC818GTQ chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Universal Information LED

When this LED blinks red quickly, it indicates a fan failure. This LED will be blue when used for UID (Unit Identifier). When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists. See the table below for descriptions of the LED states.

Figure 3-1. Universal Information LED States

Universal Information LED States	
State	Indication
Fast Blinking Red (1x/sec)	Fan Fail
Solid Red	CPU Overheat
Solid Blue	Local UID Button Depressed
Blinking Blue	IPMI-Activated UID

Note: deactivating the UID LED must be performed in the same way it was activated. (If the UID LED was activated via IPMI, you can only turn the LED off via IPMI and not with the UID button.)

NIC2

Indicates network activity on GLAN2 when flashing .

NIC1

Indicates network activity on GLAN1 when flashing .

HDD

This light indicates SATA and/or DVD-ROM drive activity when flashing.

Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 SATA Drive Carrier LEDs

- **Green:** Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

- **Red:** The red LED to indicate an SATA drive failure. If one of the SATA drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Note: power should always be disconnected before performing any service on the system.

Basic electrical safety precautions shall be followed to protect yourself from harm and the server from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- This product may be connected to an IT power system. In all cases, make sure that the unit is also reliably connected to Earth (ground).

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the server clean and free of clutter.

- The server weighs approximately 47 lbs. (21.4 kg) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

Electrostatic Discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.

- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.

- Touch a grounded metal object before removing the board from the antistatic bag.

- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.

- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.

- When handling chips or modules, avoid touching their pins.

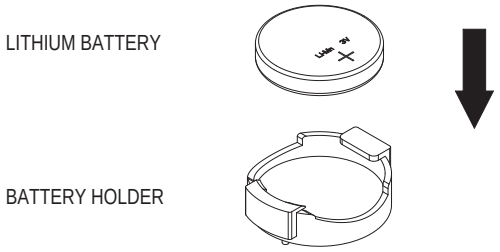
- Put the serverboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the system is operating to ensure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the X8DTG-DF serverboard into the chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

5-1 Handling the Serverboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Serverboard Installation

This section explains the first step of physically mounting the X8DTG-DF into the SC818GTQ-1400 chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the serverboard, follow the procedure in reverse order.

Installing to the Chassis

1. Access the inside of the system by removing the screws from the back lip of the top cover of the chassis, then pull the cover off.

2. Make sure that the I/O ports on the serverboard align properly with their respective holes in the I/O shield at the back of the chassis.

3. Carefully mount the serverboard to the serverboard tray by aligning the board holes with the raised metal standoffs that are visible in the chassis.

4. Insert screws into all the mounting holes on your serverboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the serverboard ground to provide a continuous ground for the system.

5. Finish by replacing the top cover of the chassis.

Warning: To avoid damaging the serverboard and its components, do not apply any force greater than 8 lbs. per square inch when installing a screw into a mounting hole.

5-3 Connecting Cables

Now that the serverboard is installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-9 for connector locations.)

- SATA drive data cable (SATA1 ~ 3)
- SGPIO cable (T-SGPIO-0)
- Control Panel cable (JF1)
- GPU power cables (JPW2, JPW3 - 6016GT series only)

Important! Make sure the the cables do not come into contact with the fans.

Connecting Power Cables

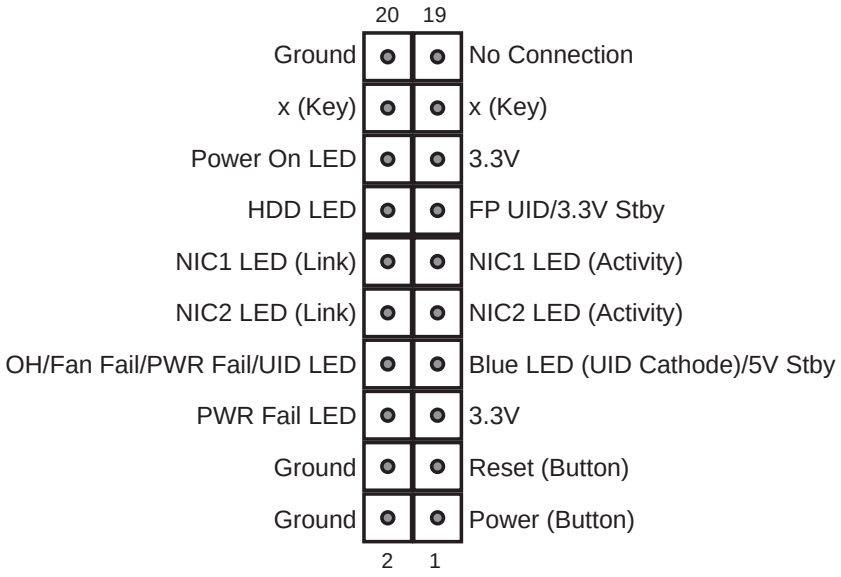
The X8DTG-DF has a 20-pin proprietary power supply connector (JPW1) for connection to the ATX power supply. In addition, there are two 8-pin secondary power connectors (JPW2, JPW3) that also must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single ribbon cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

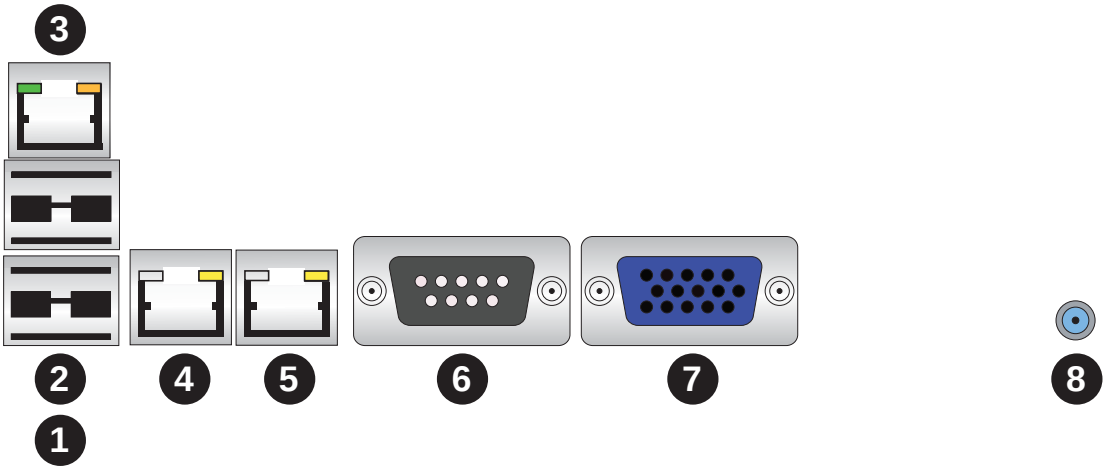
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports



IO Ports			
1	USB Port 0	5	LAN Port 2
2	USB Port 1	6	COM Port
3	IPMI Dedicated LAN	7	VGA Port
4	LAN Port 1	8	UID Button

5-5 Installing the Processor and Heatsink

Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

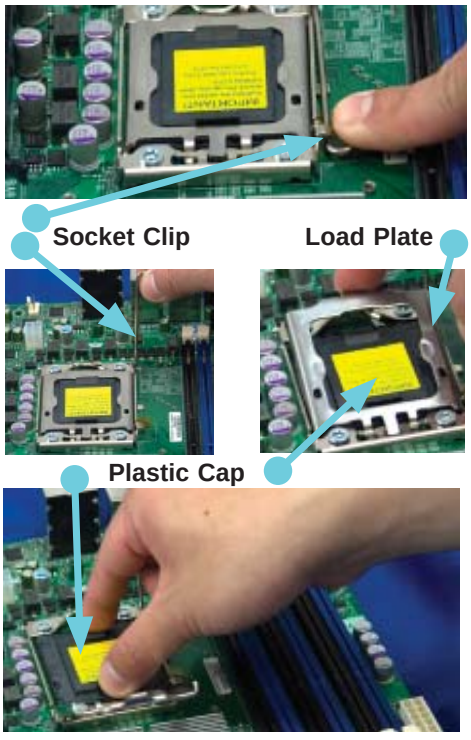
Notes:

- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

Installing an LGA1366 Processor

1. Press the socket clip to release the load plate, which covers the CPU socket, from its locked position.
2. Gently lift the socket clip to open the load plate.
3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.

Note: The photos on this page and succeeding pages are for illustration purposes only. They do not necessarily reflect the exact product(s) described in this manual.



Holding the north & south edges

1. After removing the plastic cap, use your thumb and the index finger to hold the CPU at the north and south center edges.

2. Align the CPU key (the semi-circle cutout) with the socket key (the notch below the gold color dot on the side of the socket).

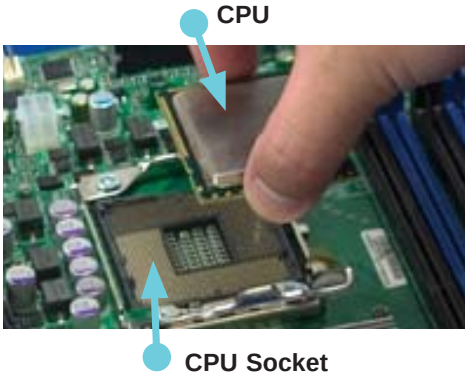
3. Once the CPU and the socket are aligned, carefully lower the CPU straight down into the socket. Do not rub the CPU against the surface of the socket or its pins to avoid damaging the CPU or the socket.

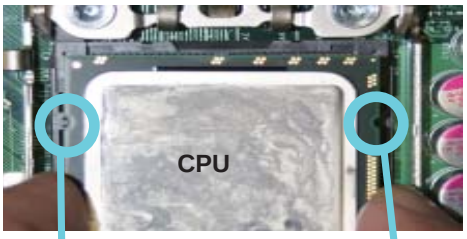
4. With the CPU in the socket, inspect the four corners of the CPU to make sure that it sits level and is properly installed.

5. Once the CPU is securely seated in the socket, lower the CPU load plate to the socket.

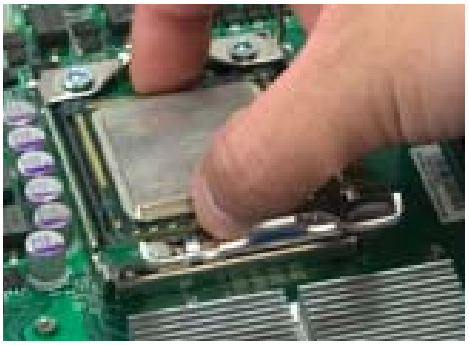
6. Use your thumb to gently push the socket clip down to the clip lock.

Important! Please save the plastic cap. The serverboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed may cause damage to the socket pins.

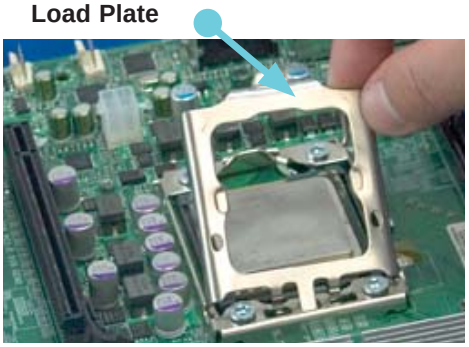




Align CPU keys with socket keys.



Load Plate



Installing a CPU Heatsink

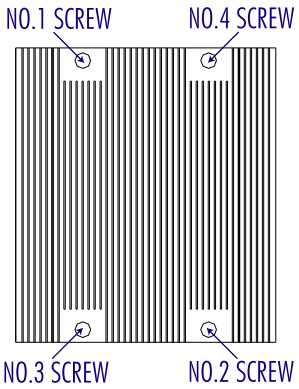
1. Remove power from the system and unplug the AC power cord from the power supply.

2. Do not apply any thermal grease to the heatsink or the CPU die; the required amount has already been applied.

3. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the (preinstalled) heatsink retention mechanism.

4. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug. Do not fully tighten the screws or you may damage the CPU.)

5. Add the two remaining screws then finish the installation by fully tightening all four screws.



Removing the Heatsink

1. Unscrew and remove the heatsink screws from the serverboard in the sequence as show in the picture above.

2. Hold the heatsink and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!!)

3. Once the heatsink is loose, remove it from the CPU socket.

4. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before you re-install a heatsink.

Note: see Chapter 6 for details on installing the air shroud.

5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory Support

The X8DTG-DF supports up to 192 GB of registered ECC or up to 48 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 MHz SDRAM in 12 DIMM slots. See the following table for memory installation.

Notes: With unbuffered ECC/non-ECC memory, 2 GB is the maximum DIMM size that can be supported per slot.

Memory speed support is dependent on the type of CPU used on the board.

Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMM 1A. For best memory performance, please install memory modules of the same type and same speed on the memory slots as indicated on the tables below.

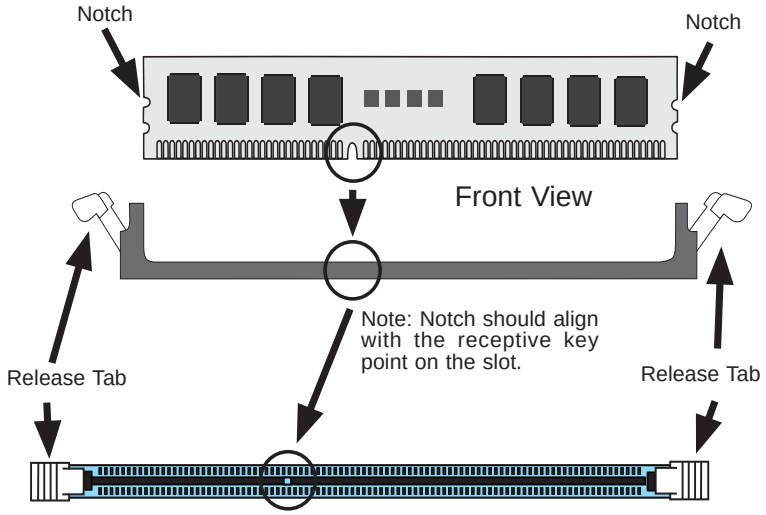
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-4).

3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

Figure 5-3. DIMM Installation

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove:
Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



DIMM Population Table				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Reg.= Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
2	1	Reg. DDR3 ECC	800,1066,1333	SR or DR
2	1	Reg. DDR3 ECC	800,1066	QR
2	2	Reg. DDR3 ECC	800,1066	Mixing SR, DR
2	2	Reg. DDR3 ECC	800	Mixing SR, DR,QR

Notes: Due to OS limitations, some operating systems may not show more than 4 GB of memory.

Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. See chart below.

Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Available (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration Area 1	256 MB	3.76 GB
PCI Express (256 MB)	256 MB	3.51 GB
PCI Enumeration Area 2 (if needed) -Aligned on 256-M boundary-	512 MB	3.01 GB
VGA Memory	16 MB	2.85 GB
TSEG	1 MB	2.84 GB
Memory available for the OS & other applications		2.84 GB

Populating DIMMs for Optimal Performance For One CPU (CPU1) Installed			
	Branch 0	**Branch 1**	**Branch 2**
3 DIMMs	P1 DIMM1A	P1 DIMM2A	P1 DIMM3A

Populating DIMMs for Optimal Performance For One CPU (CPU2) Installed			
	Branch 0	**Branch 1**	**Branch 2**
3 DIMMs	P2 DIMM1A	P2 DIMM2A	P2 DIMM3A

Populating DIMMs for Optimal Performance For Two CPUs Installed						
	CPU1			**CPU2**		
	Branch 0	**Branch 1**	**Branch 2**	**Branch 0**	**Branch 1**	**Branch 2**
6 DIMMs	P1-DIMM1A	P1-DIMM2A	P1-DIMM3A	P2-DIMM1A	P2-DIMM2A	P2-DIMM3A

5-6 Adding PCI Add-On Cards

The 6016XT-TF (without GPUs installed) can support four full size PCI-E x8 cards in the x16 slots and (with a riser card) one low-profile PCI-E x4 card in a x16 slot.

The 6016GT series servers can (in addition to two NVIDIA Tesla GPU cards) support one low-profile PCI-Express 2.0 x4 card via a riser card installed in the PCI-E x16 slot.

Installing an Add-on Card

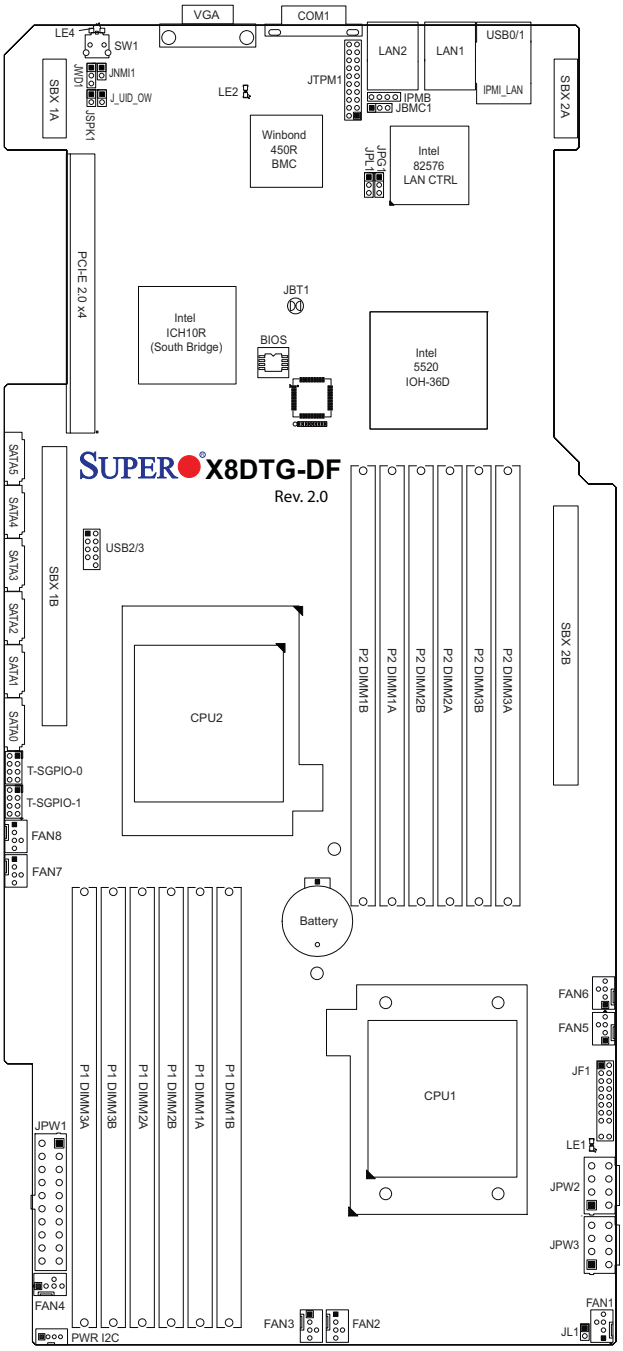
1. Begin by removing the PCI slot shield for the slot you wish to populate.

2. Fully seat the card into the riser card, pushing down with your thumbs evenly on both sides of the card.

3. Finish by using a screw to secure the top of the card shield to the chassis. The PCI slot shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

5-7 Serverboard Details

Figure 5-5. X8DTG-DF Layout
(not drawn to scale)



Notes

Jumpers not indicated are for test purposes only.

"■" indicates the location of Pin 1.

When the LE1 LED is on, power is present on the board. Make sure to unplug the AC power cable before removing or installing components.

X8DTG-DF Quick Reference

Jumper	Description	Default Setting
JBMC1	BMC (Baseboard Management CTRL) Enable	Pins 1-2 (Enabled)
JBT1	CMOS Clear	(See Section 5-9)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	LAN1/2 Enable	Pins 1-2 (Enabled)
J_UID_OW	Red LED OW (Pins 7/8 of JF1)	Off (Overwrites)
JWD1	Watch Dog	Pins 1-2 (Reset)

Connector	Description
COM1	COM1 Serial Port
FAN 1-8	System/CPU Fan Headers
IPMB	IPMB Header (for an IPMI Card)
IPMI LAN	Dedicated IPMI LAN (RJ45) Port (IPMI 2.0)
JF1	Front Panel Connector
JL1	Chassis Intrusion
JLPC80	JLPC80 Connector
JNMI1	NMI (Non-Maskable Interrupt) Header
JPI^{2}C	Power SMB (I^{2}C1)
JPSK1	Internal Speaker/Buzzer Header
JPW1	12V 20-pin Power Connector (See Chpt. 2)
JPW2/JPW3	GPU Card Power Connectors
JTPM1	Trusted Platform Module Header
LAN1/2	Gigabit Ethernet (RJ45) Ports
PWR I2C	Power System Management Bus I^{2}C Header
SATA1 ~ SATA6	(Intel South Bridge) SATA Ports
SBX1B, SBX2B	GPU (Graphic Processing Unit) Slots
SW1	Unit Identifier Button
T-SGPIO-0/T-SGPIO-1	Serial General Purpose Input/Output Headers
USB0/1, USB 2/3	Universal Serial Bus (USB) Ports 0/1, 2/3
VGA	Video Port

LED	Description
LE1	Onboard Standby PWR warning LED Indicator
LE2	BMC LED Indicator
LE4	(Rear) Unit Identifier (UID) LED Indicator

5-8 Connector Definitions

Main ATX Power Supply Connector

The primary power supply connector (JPW1) is a proprietary design. Refer to the table on the right for the pin definitions of this connector. You must also connect the 8-pin (JPW2/JPW3) graphics card power connectors to your power supply (see below).

20-pin Main Power Connector Pin Definitions

Pin#	Definition	Pin #	Definition
11	PS On	1	Ground
12	5VSB	2	Ground
13	Ground	3	Ground
14	Ground	4	Ground
15	Ground	5	Ground
16	NC2	6	NC1
17	12V	7	12V
18	12V	8	12V
19	12V	9	12V
20	12V	10	12V

Graphics Card Power Connectors

JPW2 and JPW3 must also be connected to the power supply to provide power for the GPUs. See the table on the right for pin definitions.

Graphics Card Power Connector Pin Definitions

Pin#	Definition	Pin #	Definition
1	12V	5	Ground
2	12V	6	Ground
3	12V	7	Ground
4	Ground	8	Ground

Required Connection for GPUs

Notes: For the these proprietary connectors to work properly, please customize your PWR cables based on the SMC PWR Connector Pin-Out Definitions listed in the tables above. For the GPUs to work properly, connect the GPU power connectors (JPW2/JPW3) to the power supply (6016GT series only).

Power Button Connector

The PW_ON connector is on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions. This header should be connected to the chassis power button. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	Power
2	Ground

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)

Pin#	Definition
5	3.3V
6	PWR Fail LED

Overheat/Fan Fail/UID LED

Connect an LED cable to pins 7 and 8 of JF1 for the Overheat/Fan Fail and UID LED connections. The red LED (pin 8) provides warning of an overheat or fan failure. The blue LED (pin 7) works as the UID LED indicator for the front panel UID button located on pins 13~14 of JF1. When Jumper J_UID_OW is set to off (default), the red LED takes precedence over the blue LED. (See Page 3-2 for details.) Refer to the table on the right for pin definitions.

OH/Fan Fail/Blue_UID LED Pin Definitions (JF1)

Pin#	Definition
7	Blue_LED-Cathode(UID)/5.5V.SB
8	OH/Fan Fail/UID LED (Red)

OH/Fan Fail LED Status (Red LED)

State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

NIC2 (JLAN2) LED

The LED connections for JLAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)

Pin#	Definition
9	Vcc
10	Ground

NIC1 (JLAN1) LED

The LED connections for JLAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)

Pin#	Definition
11	Vcc
12	Ground

HDD/FP UID Button

The HDD/UID button connections are located on pins 13/14 of JF1. Attach a hard-drive LED cable to display HDD or SATA activity. This connection can also be used for the front panel UID (Unit Identifier) button. (The UID LED on pin 7 of JF1 works in conjunction with the UID button.) When the user presses and releases the UID button, the UID LED will be turned on or off to indicate the location of the unit in a stack or rackmounted servers.

HDD/UID LED Pin Definitions (JF1)

Pin#	Definition
13	UID Signal/3.3V
14	HDD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)

Pin#	Definition
15	+3.3V Stby
16	Control

Fan Headers

The X8DTG-DF has eight chassis/system fan headers (Fan1 to Fan8). All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. Fan speed control is available for 4-pin fans but not supported by 3-pin fans. The fan speeds are controlled by Thermal Management via Hardware Monitoring in the Advanced Setting in the BIOS. (The Default setting is disabled.) See the table on the right for pin definitions.

Fan Header Pin Definitions

Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Chassis Intrusion

The Chassis Intrusion header is designated JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened

Chassis Intrusion Pin Definitions

Pin#	Definition
1	Intrusion Input
2	Ground

LAN1/2 (Ethernet Ports)

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.

Universal Serial Bus (USB)

There are two Universal Serial Bus ports located on the I/O panel and two additional USB headers located on the serverboard. The headers can be used to provide front side USB access (cables not included). See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions

USB0/1		USB2/3	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	Key

Serial Port

A serial port is included on the I/O backpanel. See the table on the right for pin definitions.

Serial Port Pin Definitions

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

SGPIO Headers

The SGPIO (Serial General Purpose Input/Output) headers support serial link interfaces for the onboard SATA connectors. See the table on the right for pin definitions.

SGPIO Header Pin Definitions

Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

NMI Header

Use this header to issue a non-maskable interrupt. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions

Pin#	Definition
1	Control
2	Ground

PWR I²C Connector

This System Management Bus (I²C) connector is used to monitor the status of the power supply. See the table on the right for pin definitions.

PWRI2C Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground

IPMB

A System Management Bus header for the IPMI is located at IPMB. Connect the appropriate cable here to use the IPMB I²C connection on your system.

IPMB Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

Unit Identifier Button (SW1)

There are two Unit Identifier (UID) buttons and LED indicators on the serverboard. The Front Panel UID button connects to pin 13 on the JF1 header and its LED connects to pin 7 of JF1. The Rear UID button (SW1) is located next to the VGA port and the Rear UID LED is designated LE4. When you press the UID button on the front or rear of the server, both the front and rear LEDs will turn on. Press a UID button again to turn off both LEDs. These UID LEDs provide easy identification of a system located in a large rack of servers. See the table on the right for pin definitions.

UID Button	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

Note: the UID LED is supported by either the physical button or the BMC. When controlled by the physical button it is solid on. When controlled by the BMC, it blinks.

Internal Speaker

Attach a speaker to the JSPK1 pins to provide audible alarms for the beep codes. See the table on the right for pin definitions.

Internal Speaker Pin Definitions

Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker

Trusted Platform Module Header

A Trusted Platform Module header (JTPM1) provides TPM support to enhance data integrity and system security. Refer to the table on the right for pin definitions.

Trusted Platform Module (TPM) Header Pin Definitions

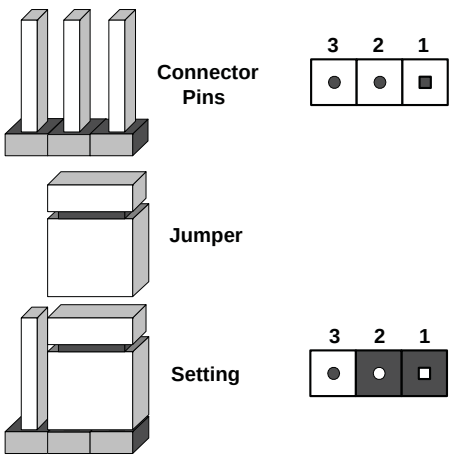
Pin#	Definition	Pin #	Definition
1	LPC Clock	2	Ground
3	LPC Frame#	4	Key
5	LPC Reset#	6	+5V (X)
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	Ground
13	SCL	14	SDAT
15	+3V Dual	16	SERIRQ (X)
17	Ground	18	CLKRUN (X)
19	LPCPD# (X)	20	LDRQ# (X)

5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS*.

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 to enable or disable the LAN1/LAN2 Ethernet ports on the serverboard. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings

Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

Watch Dog Jumper Settings

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

J_UID_OW (Overwriting)

When J_UID_OW is set to Open (default), the red LED (Overheat/Fan Fail/PWR Fail/ UID LED) located on pin 8 of the Front Control Panel (JF1) will take precedence over the Blue UID_LED located on pin 7 of JF1. (That is, when the red LED is on the blue LED will be turned off. When the red LED is off, the blue UID_LED can be on or off.) In other words, the red LED signal overwrites the blue UID_LED signal if J_UID-OW is set to off. When the jumper J_UID_OW is Closed, the red LED and the Blue_UID_LED work independently of each other and the red LED will have no effect on the blue LED. See the table below for jumper settings.

J_UID-OW (Overwriting) Jumper Settings

Jumper	Definition
Open	Red Fail LED overwrites the Blue UID LED Red LED: On, Blue LED: Off, Red LED: Off, Blue LED: On or Off
Closed	Red LED does not overwrite and has no effect on the Blue UID LED Red LED: On, Blue LED: On,Off Red LED: Off, Blue LED: On, Off

BMC Enable/Disable

Use jumper JPBMC1 to enable or disable the Winbond WPCM450 BMC (Baseboard Management Controller), which supports IPMI 2.0. See the table on the right for jumper settings.

BMC Enable/Disable Jumper Settings	
Both Jumpers	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

5-10 Onboard Indicators

LAN1/2 LEDs

The Ethernet ports have two LEDs. On each port, one LED indicates activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

Note: the dedicated IPMI LAN does not operate at 1 Gb/s.

LAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	No connection or 10 Mb/s
Green	100 Mb/s
Amber	1 Gb/s

Onboard Power LED (LE1)

An Onboard Power LED is located at LE1. This LED Indicator is on when the system is on. Be sure to unplug the AC power cable before removing or adding any components. See the table on the right for more details.

Onboard PWR LED Indicator	
LED Color	Definition
Off	System Off (power cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State

BMC Activity LED (LE2)

A BMC Heartbeat LED is located at LE2. When LE2 is on, BMC (Baseboard Management Controller) is active.

Rear UID LED (LED4)

The UID LED is used to help locate the server for servicing. See the description of SW1 in Section 5-9 for more details.

5-11 SATA Ports

SATA Ports

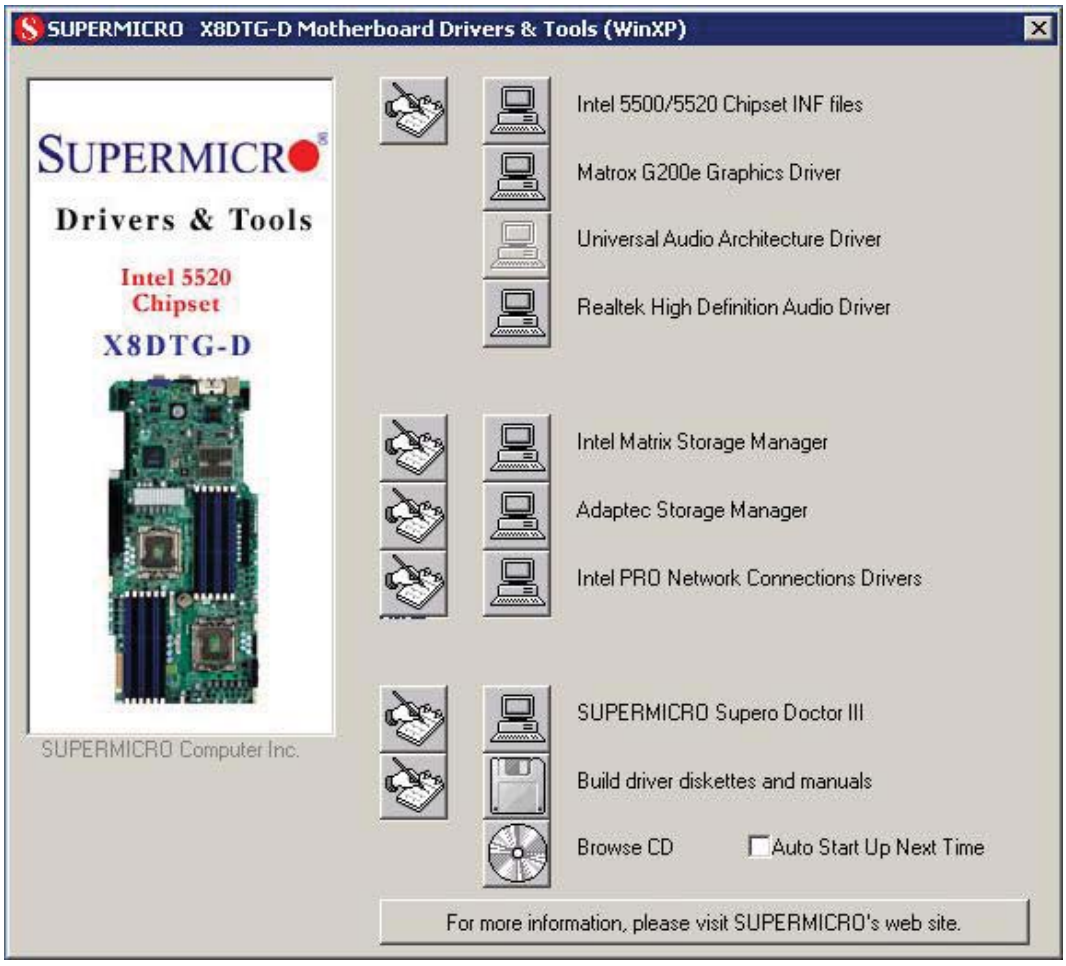
There are no jumpers to configure the onboard SATA connectors. See the table on the right for pin definitions.

SATA Port Pin Definitions

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

5-12 Installing Software

After the hardware has been installed, you should first install the operating system and then the drivers. The necessary drivers are all included on the Supermicro CDs that came packaged with your system.



Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

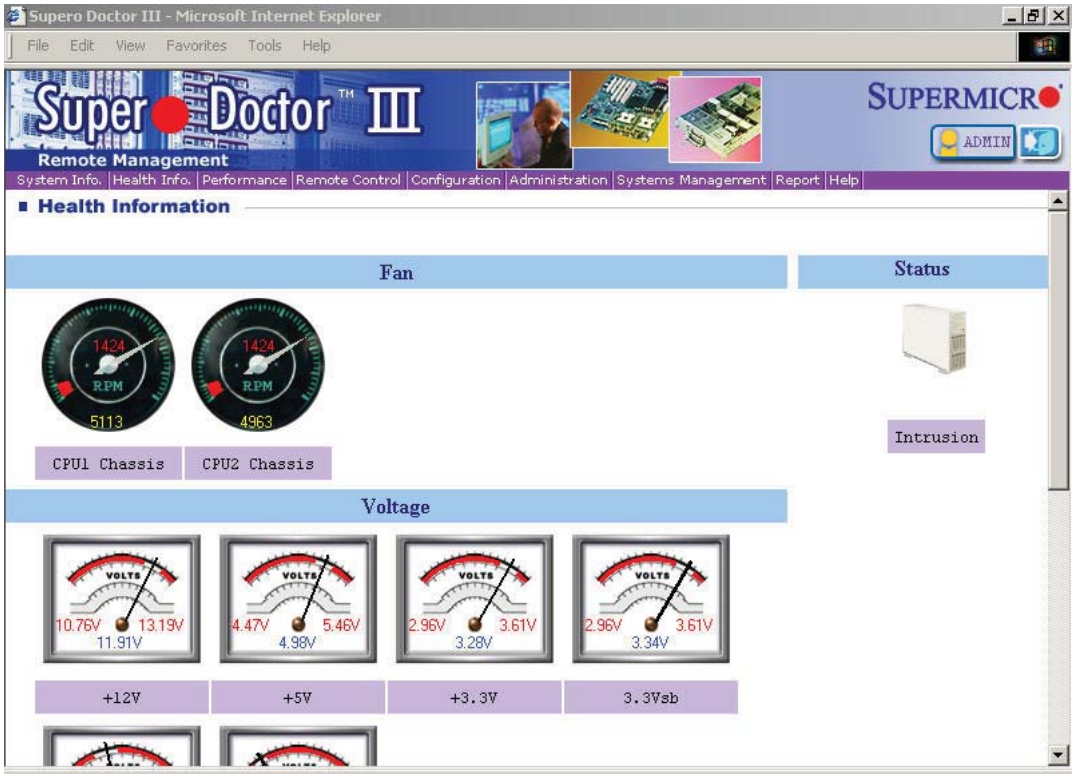
Supero Doctor III

The Supero Doctor III program is a web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The Supero Doctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor III is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within Super Doctor, as the Super Doctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor III.

Supero Doctor III Interface Display Screen (Health Information)



Supero Doctor III Interface Display Screen (Remote Control)

Supero Doctor III - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Super Doctor III
Remote Management
SUPERMICRO
ADMIN
System Info. Health Info. Performance Remote Control Configuration Administration Systems Management Report Help
Remote Control
Graceful Power Control
Open Console
Power Control
Enter
Comm.
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

Note: SD III Software Revision 1.0 can be downloaded from our Web Site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download the SDIII User's Guide at: http://www.supermicro.com/manuals/other/SDIII_User_Guide.pdf. For Linux, we will recommend using Supero Doctor II.

Notes

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC818GTQ chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

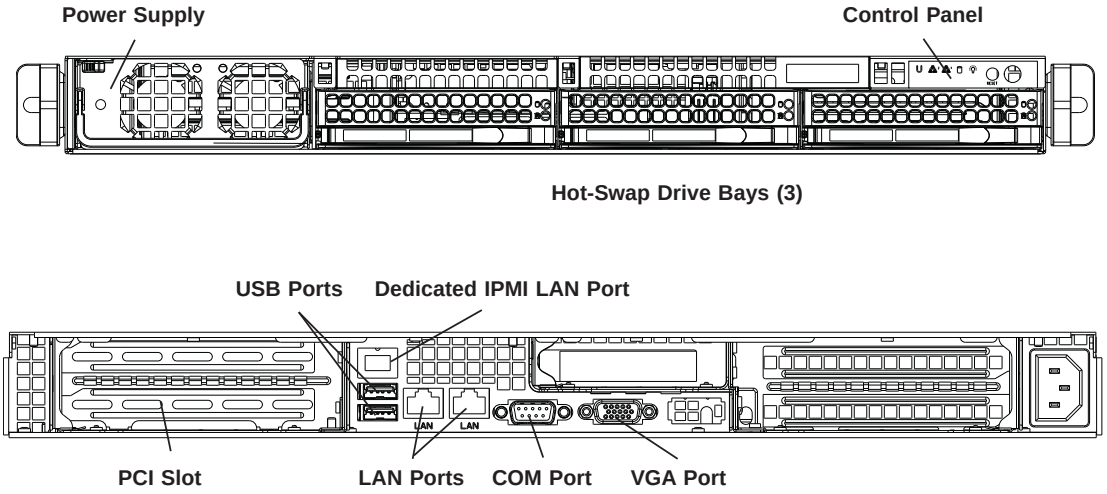
Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully.

The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Figure 6-1. Chassis: Front and Rear Views



6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Installation."

6-3 System Cooling

Eight 4-cm counter-rotating fans provide the cooling for the system. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. The SC818GTQ chassis provides two additional open fan housings, where an additional system fan may be added for optimal cooling.

It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

Replacing a System Fan (Figure 6-2)

1. If the BIOS is not being utilized to determine which fan has failed, open the top cover of the chassis while the system is running to locate the position of the failed fan. Never run the server for an extended period of time with the top cover open.

2. Turn off the power to the system and unplug the AC power cord.

3. Remove the failed fan's wiring from the backplane.

4. Remove the four pins securing the fan to the fan tray.

5. Lift the failed fan from the fan tray and out of the chassis.

6. Place the new fan into the vacant space in the fan tray, while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans in the same fan tray.

7. Reconnect the fan wires to the exact same chassis fan headers as the previous fan.

8. Reconnect the AC power cord, power up the system and check that the fan is working properly before replacing the chassis cover.

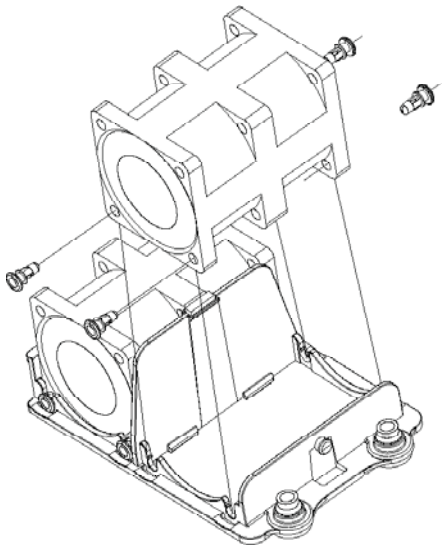


Figure 6-2. Removing a Fan from the Fan Tray

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

Hard Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace hard drives. Proceed to the next section for instructions.

Peripheral Drives: The SC818GTQ chassis includes space for a variety of peripheral drive options, including a 2.5" hard disk drive, DVD-ROM or floppy drive. For a complete listing of peripheral drive options, visit the Supermicro web site at:

http://www.supermicro.com/products/chassis/1U/818/SC818G-1400.cfm

Hard Drive Installation

The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

Removing Hard Drive Carriers from the Chassis

1. Press the release button on the drive carrier. This extends the drive carrier handle.

2. Use the handle to pull the drive carrier out of the chassis.

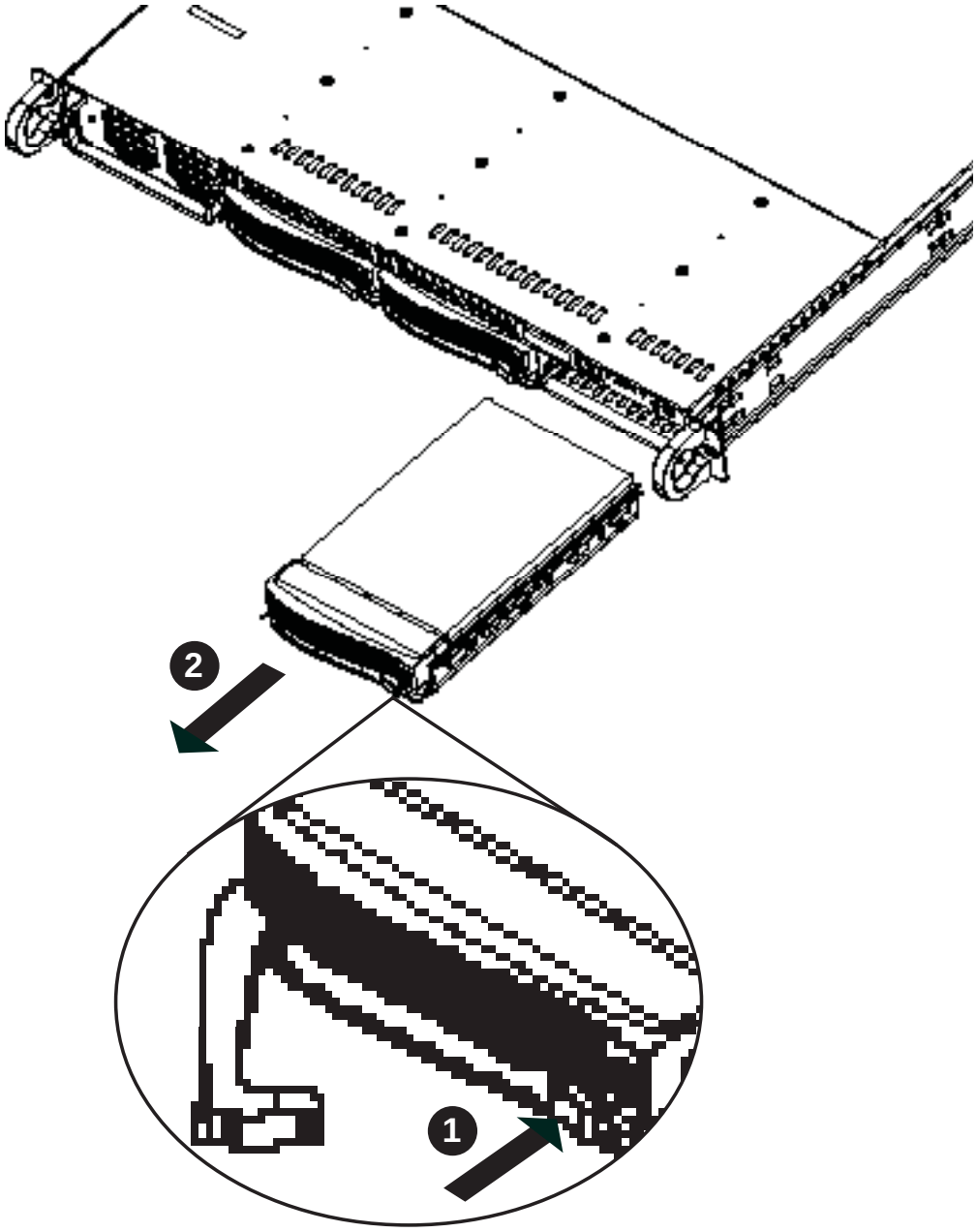


Figure 6-3. Removing a Hard Drive Carrier

Warning: Except for short periods of time (swapping hard drives), do not operate the server with the hard drive carriers removed.

Installing a Hard Drive to the Hard Drive Carrier

1. Remove the two screws securing the dummy drive to the carrier.
2. Remove the dummy drive from the carrier.
3. Install a new drive into the carrier with the printed circuit board side facing downward so that the mounting holes align with those in the carrier.
4. Secure the hard drive by tightening all six screws.

Installing a Hard Drive Carrier Into the Chassis

1. Insert the loaded hard drive carrier into the drive bay of the chassis
2. Push the drive carrier into the drive bay, pushing in the handle of the carrier until it clicks into the locked position.

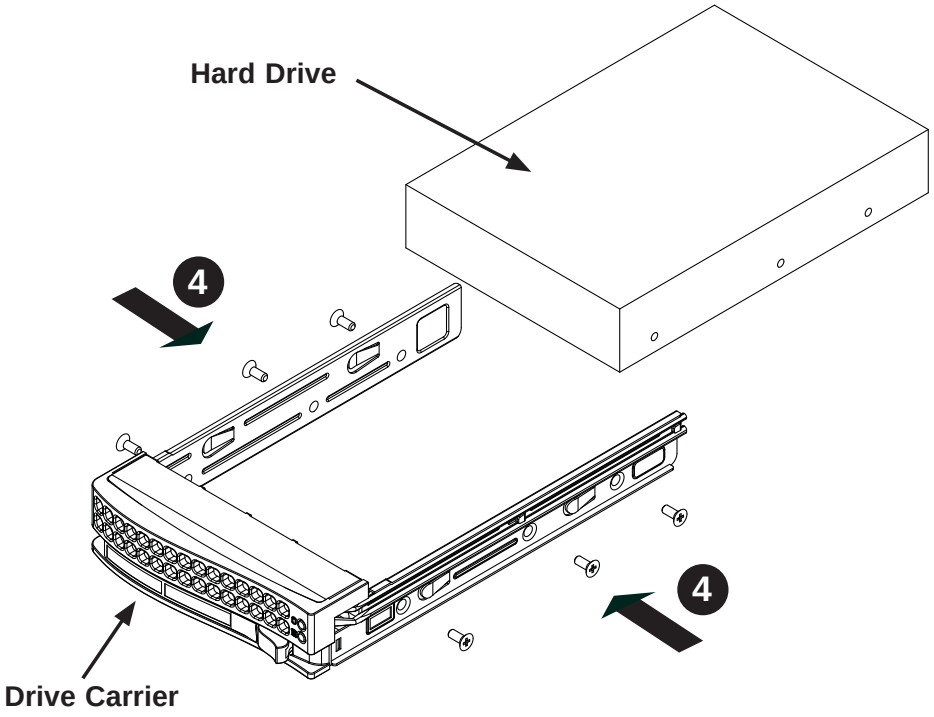


Figure 6-4. Installing a Hard Drive to the Carrier

Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at http://www.supermicro.com/products/nfo/storage.cfm

Note: When installing the hard drive carrier that is next to the power supply, the power supply handle must be lifted before extending the hard drive carrier handle, or before inserting the hard drive carrier into the drive bay.

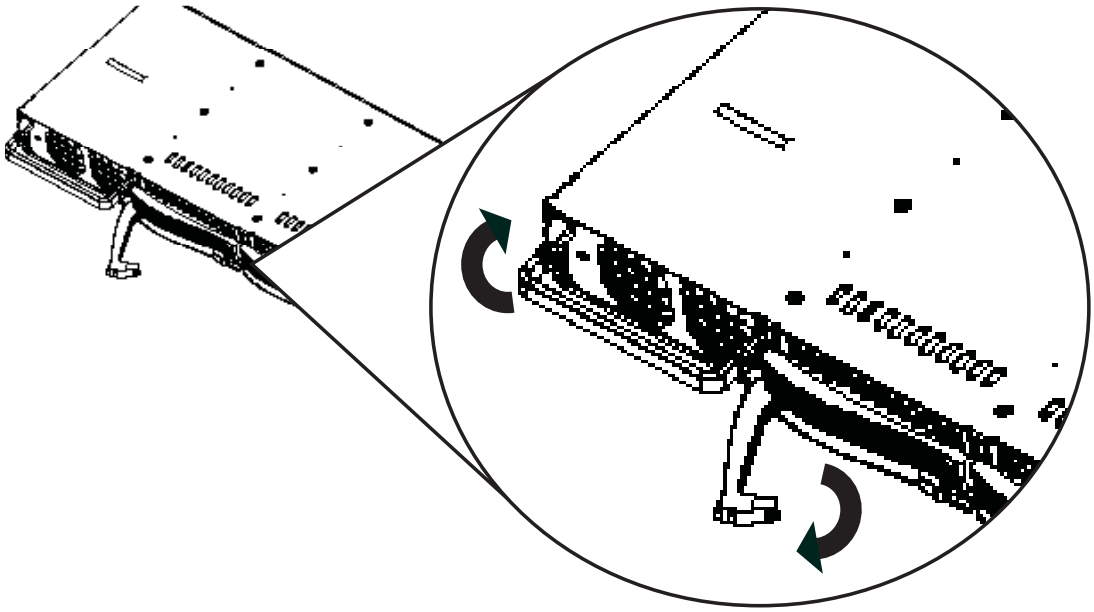


Figure 6-5. Installing/Removing the Carrier Next to the Power Supply

Peripheral Drive Installation

Installing or Replacing a Peripheral Drive

1. Unplug the main power cord to the chassis.

2. Unplug the power and data cables from the motherboard and/or backplane.

3. If you are adding a new drive: Remove the dummy tray from the drive bay The mini-bezel can be removed by pulling out the hard drive beneath the drive bay, then pulling the mini-bezel forward.
   If you are replacing a drive: Locate the locking tab at the rear (left hand side when viewed from the front) of the peripheral drive. Push the tab toward the drive and push the drive unit out the front of the chassis.

4. Insert the new drive unit in the slot until the tab locks in place.

5. Reconnect the data and power cables.

6. Replace the chassis cover (replace the server in the rack, if necessary) and power up the system.

6-5 Installing the Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency. The air shroud for the SC818GTQ chassis does not require screws to set up.

Installing the Air Shroud

1. Position the air shroud in the chassis as illustrated above.

2. Align the notch (A) on the air shroud with the pin (B) on the add-on card bracket.

3. Slide the pin (B) into the back of the notch (A)

4. Lower the front of the air shroud over the fan tray, sliding the front notches (C) over the pins on the fan tray (D).

Checking the Air Flow

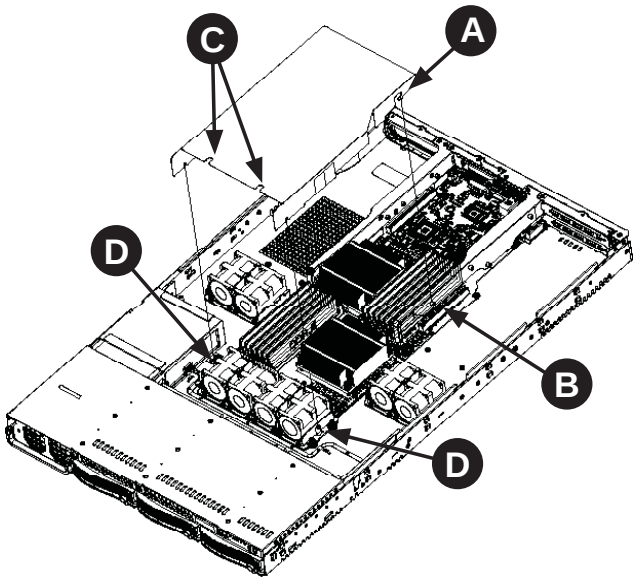
Checking the Server's Air Flow

1. Make sure there are no wires or other objects obstructing the airflow in and out of the server. Pull all excess cabling out of the airflow path.

2. Do not operate the server without all drive carriers installed in the drive bays. Use only recommended server parts.

3. The control panel LEDs inform you of the overall system status. See “Chapter 3 System Interface” for details on the LEDs and the control panel buttons.

Figure 6-6. Installing the Air Shroud



6-6 Power Supply

The system includes a single 1400 watt power supply, which is auto-switching capable. Power must be removed from the system when replacing the power supply.

Power Supply Failure

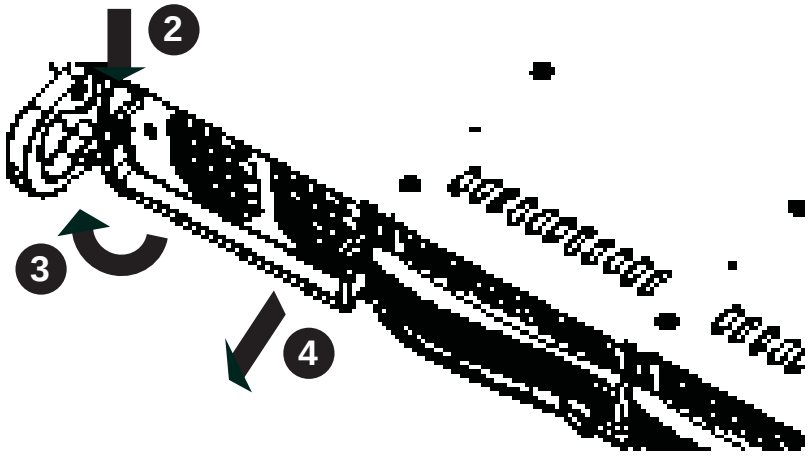
If the power supply module fails, the system will shut down and you will need to replace the module. Replacements can be ordered directly from Supermicro (see contact information in the Preface).

As there is only one power supply module in the system, power must be completely removed from the server before removing and replacing the power supply for whatever reason.

Removing/Replacing the Power Supply (Figure 6-6)

1. Power down the server and unplug the AC power cord.
2. Push the release tab on the front of the power supply.
3. Pull the power supply out using the attached handle.
4. Replace the failed power module with the same model (See Appendix C).
5. Push the new power supply module into the power bay until you hear a click.
6. Reconnect the AC power cord and depress the power button on the control panel to restart the system.

Figure 6-7. Removing/Replacing the Power Supply



Notes

Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DTG-DF. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

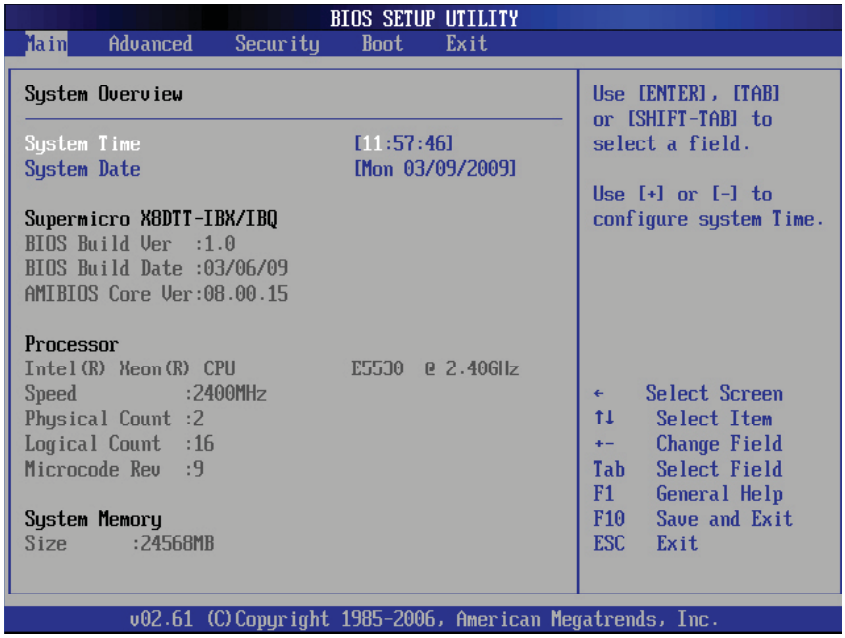
Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

Warning! Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

7-2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



System Overview: The following BIOS information will be displayed:

System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Key in new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.)

Supermicro X8DTG-DF

- **BIOS Build Version**: This item displays the BIOS revision used in your system.
- **BIOS Build Date**: This item displays the date when this BIOS was completed.
- **AMI BIOS Core Version**: This item displays the revision number of the AMI BIOS Core upon which your BIOS was built.

Processor

The AMI BIOS will automatically display the status of the processor used in your system:

- **CPU Type**: This item displays the type of CPU used in the motherboard.
- **Speed**: This item displays the speed of the CPU detected by the BIOS.
- **Physical Count**: This item displays the number of processors installed in your system as detected by the BIOS.
- **Logical Count**: This item displays the number of CPU Cores installed in your system as detected by the BIOS.
- **Micro_code Revision**: This item displays the revision number of the BIOS Micro_code used in your system.

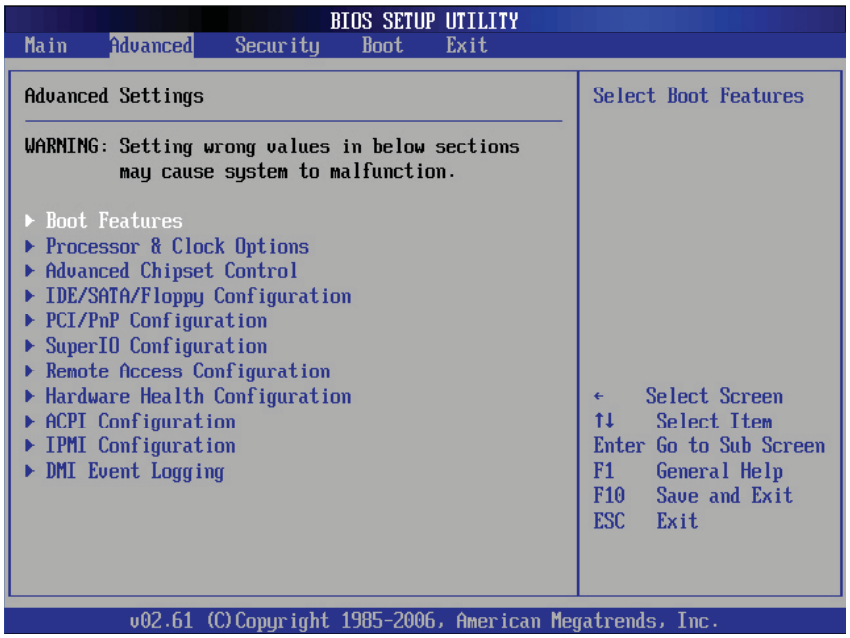
System Memory

This displays the size of memory available in the system:

- **Size**: This item displays the memory size detected by the BIOS.

7-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and hit <Enter> to access the submenu items:



▶BOOT Features

Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

This sets the display mode for Option ROM. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

This feature selects the Power-on state for Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Hit 'Del' Message Display

This feature displays "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are Enabled and **Disabled.**

Power Configuration

Power Button Function

If set to Instant_Off, the system will power off immediately as soon as the user hits the power button. If set to 4_Second_Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant_Off** and 4_Second_Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

Watch Dog Timer

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled.**

▶Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

Ratio CMOS Setting

This option allows the user to set the ratio between the CPU Core Clock and the FSB Frequency. (**Note**: if an invalid ratio is entered, the AMI BIOS will restore the setting to the previous state.) The default setting depends on the type of CPU installed on the motherboard. The default setting for the CPU installed in your motherboard is **[18]**. Press "+" or "-" on your keyboard to change this value. An Auto setting is also included.

C1E Support

Select Enabled to use the feature of Enhanced Halt State. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware pre fetcher will pre fetch streams of data and instructions from the main memory to the L2 cache in the forward or backward manner to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if **Enabled**.

Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1 and 2.

Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consump-

tion and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

Intel® TurboMode Technology

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**.

C-State package limit setting

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

C1 Auto Demotion

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled.**

C3 Auto Demotion

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below:

▶CPU Bridge Configuration

QPI Links Speed

This feature selects QPI's data transfer speed. The options are Slow-mode, and **Full Speed**.

QPI Frequency

This selects the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

QPI L0s and L1

This enables the QPI power state to low power. L0s and L1 are automatically selected by the motherboard. The options are **Disabled** and Enabled.

Memory Frequency

This feature forces a DDR3 frequency slower than what the system has detected. The available options are **Auto**, Force DDR-800, Force DDR-1066, and Force DDR-1333.

Memory Mode

The options are **Independent**, Channel Mirror, Lockstep and Sparing.

Independent - All DIMMs are available to the operating system.

Channel Mirror - The motherboard maintains two identical copies of all data in memory for redundancy.

Lockstep - The motherboard uses two areas of memory to run the same set of operations in parallel.

Sparing - A preset threshold of correctable errors is used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory.

Demand Scrubbing

A memory error-correction scheme where the Processor writes corrected data back into the memory block from where it was read by the Processor. The options are Enabled and **Disabled**.

Patrol Scrubbing

A memory error-correction scheme that works in the background looking for and correcting resident errors. The options are Enabled and **Disabled**.

Throttling - Closed Loop/Throttling - Open Loop

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are **Disabled** and Enabled. If Enabled, the following items will appear:

Hysteresis Temperature

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the set DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are Disabled, **1.5°C**, 3.0°C, and 6.0°C.

Guardband Temperature

This is the temperature which applies to the DIMM temperature threshold. Each step is in 0.5^{o}C increment. The default is **[006]**. Press "+" or "-" on your keyboard to change this value.

Inlet Temperature

This is the temperature detected at the chassis inlet. Each step is in 0.5^{o}C increment. The default is **[070]**. Press "+" or "-" on your keyboard to change this value.

Temperature Rise

This is the temperature rise to the DIMM thermal zone. Each step is in 0.5^{o}C increment. The default is **[020]**. Press "+" or "-" on your keyboard to change this value.

Air Flow

This is the air flow speed to the DIMM modules. Each step is one mm/sec. The default is **[1500]**. Press "+" or "-" on your keyboard to change this value.

Altitude

This feature defines how many meters above or below sea level the system is located. The options are **Sea Level or Below,** 1~300, 301~600, 601~900, 901~1200, 1201~1500, 1501~1800, 1801~2100, 2101~2400, 2401~2700, 2701~3000.

DIMM Pitch

This is the physical space between each DIMM module. Each step is in 1/1000 of an inch. The default is **[400]**. Press "+" or "-" on your keyboard to change this value.

▶North Bridge Configuration

This feature allows the user to configure the settings for the Intel IOH-36D chip.

Crystal Beach/DMA (Direct Memory Access)

This feature works with the Intel I/O AT (Acceleration Technology) to accelerate the performance of TOE devices. (**Note**: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of this add-on card.) When this feature is set to Enabled, it will enhance overall system performance by providing direct memory access for data transferring. The options are Enabled and **Disabled.**

Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

IOH PCIE Port1 Bifurcation

This feature allows the user to set IOH Bifurcation configuration for the PCI-E Port 1. The options are X4X4X4X4, X4X4X8, X8X4X4, X8X8, and **X16.**

IOH PCIE Max Payload Size

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128 MB; while others, with a payload size of 256 MB which inhibits the coalesce feature. Please refer to your add-on card user guide for the desired setting. The options are 256 MB and **128MB**.

▶SouthBridge Configuration

This feature allows the user to configure the settings for the Intel ICH South Bridge chipset.

USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled, 2 USB ports, 4 USB ports, 6 USB ports, 8 Ports, 10 Ports and **12 USB ports**.

Legacy USB Support

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vise versa. The settings are Disabled, **Enabled** and Auto.

USB 2.0 Controller

Select Enabled to activate the onboard USB 2.0 controller. The options are **Enabled** and Disabled.

USB 2.0 Controller Mode

This setting allows you to select the USB 2.0 Controller mode. The options are **Hi-Speed (480 Mbps**) and Full Speed (12 Mbps).

BIOS EHCI Hand-Off

Select Enabled to enable BIOS Enhanced Host Controller Interface support to provide a workaround solution for an operating system that does not have EHCI

Hand-Off support. When enabled, the EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

▶IDE/SATA/Floppy Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE devices and displays the following items:

SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, **Compatible** and Enhanced.

Configure SATA#1 as

This feature allows the user to select the drive type for SATA#1. The options are **IDE,** RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear. When the option-AHCI is selected, the item-SATA AHCI will be available.)

ICH RAID Code Base (This feature is available when the option-RAID is selected)

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

SATA AHCI (This feature is available when the option-AHCI is selected)

Select Enable to enable the function of Serial ATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced programmers only.)The options are Enabled and **Disabled**. If the option-Enabled is selected, the following item will display.

Hot Plug (This feature is available when the option-Enabled is selected)

Select Enable to enable the hot plug function for the SATA devices. The options are **Enabled** and Disabled.

SATA#2 Configuration

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled, and **Enhanced**.

Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master

These settings allow the user to set the parameters of Primary IDE Master/Slave, Secondary IDE Master/Slave, Third and Fourth IDE Master slots. Hit <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

Type

Select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs.

Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs.

Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs.

Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs.

Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer bandwidth of 32-Bits. Select Enabled to enable 32-Bit data transfer.

DMA Mode

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined.

Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MBs.

Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MBs.

Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MBs.

Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MBs.

Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MBs.

Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MBs.

Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MBs. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.

Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MBs.

Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MBs.

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 66.6 MBs.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4. It has a data transfer rate of 100 MBs.

Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 133 MBs.

Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MBs. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using

the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32Bit Data Transfer

Select Enable to enable the function of 32-bit IDE data transfer. The options are **Enabled** and Disabled.

IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

▶PCI/PnP Configuration

Clear NVRAM

This feature clears the NVRAM during system boot. The options are **No** and Yes.

Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

PCI IDE BusMaster

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled.**

Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1 or LAN2 Option ROM. This is to boot computer using a network interface. The options are Enabled and **Disabled.**

▶Super IO Device Configuration

Serial Port1 Address/ Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8

as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, and 2E8/IRQ3.

▶Remote Access Configuration

Remote Access

This allows the user to enable the Remote Access feature. The options are Disabled and **Enabled**.

If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are COM 1 and **COM 2.**

Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and Boot Loader. The options are Disabled, Boot Loader, and **Always**.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are **ANSI**, VT100, and VT-UTF8.

VT-UTF8 Combo Key Support

A terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enabled** and Disabled.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

▶Hardware Health Monitor

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

Warning! 1.Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed. 2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

CPU Temperature/System Temperature

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

CPU Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This ‘Temperature Threshold’ or ‘Temperature Tolerance’ has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different ‘Temperature Tolerances’, the installed CPU can now send information to the motherboard what its ‘Temperature Tolerance’ is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25^{o}C). The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

User intervention: No action required.

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

Notes: 1. The system may shut down if it continues for a long period to prevent damage to the CPU.

2. The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

System Temperature: The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

Fan Speed Control Monitor

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select "Disabled, (Full Speed @12V)" to disable the fan speed control function and allow the onboard fans to constantly run at the full speed (12V). The Options are: 1. **Disabled (Full Speed)**, 2. Server Mode, 3. Workstation Mode.

Fan1 ~ Fan 4 Reading

This feature displays the fan speed readings from fan interfaces Fan1 through Fan5.

CPU1 Vcore, CPU2 Vcore, +5Vin, +12Vcc (V), VP1 DIMM, VP2 DIMM, 3.3Vcc (V), and Battery Voltage

▶ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Version Features

The options are **ACPI v1.0**, ACPI v2.0 and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list.The options are **Enabled** and Disabled.

APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

Headless Mode

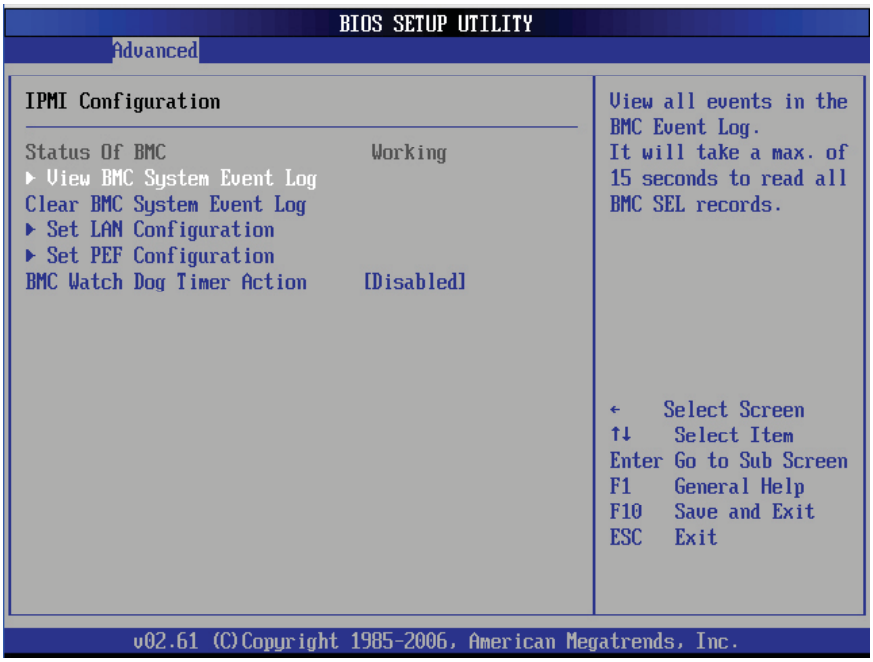
This feature is used to enable system to function without a keyboard, monitor or mouse attached The options are Enabled and **Disabled**.

High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are Enabled and **Disabled**.

▶IPMI Configuration (X8DTG-DF/-IBXF/-IBQF Only)

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at www.intel.com.


BIOS SETUP UTILITY
Advanced
IPMI Configuration
Status Of BMC Working
▶ View BMC System Event Log
Clear BMC System Event Log
▶ Set LAN Configuration
▶ Set PEF Configuration
BMC Watch Dog Timer Action [Disabled]
View all events in the BMC Event Log.
It will take a max. of 15 seconds to read all BMC SEL records.
← Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
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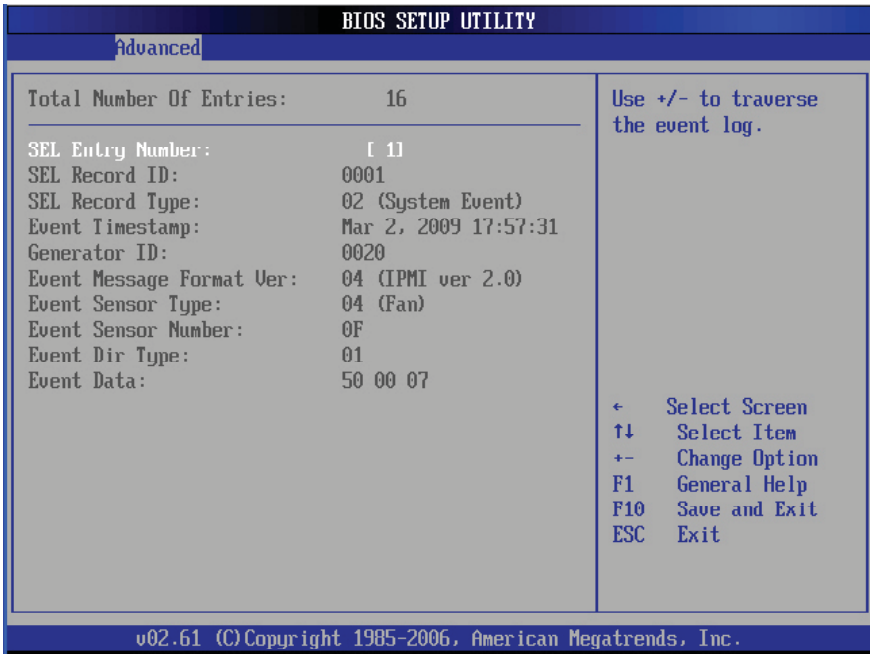
Status of BMC

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This is an informational feature which returns the status code of the BMC micro controller.

▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.


BIOS SETUP UTILITY
Advanced
Total Number Of Entries: 16
SEL Entry Number: [1]
SEL Record ID: 0001
SEL Record Type: 02 (System Event)
Event Timestamp: Mar 2, 2009 17:57:31
Generator ID: 0020
Event Message Format Ver: 04 (IPMI ver 2.0)
Event Sensor Type: 04 (Fan)
Event Sensor Number: 0F
Event Dir Type: 01
Event Data: 50 00 07
Use +/- to traverse the event log.
← Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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- Total Number of Entries
- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Timestamp, Generator ID
- Event Message Format User
- Event Sensor Type
- Event Sensor Number,
- Event Dir Type
- Event Data.

Clear BMC System Event Log

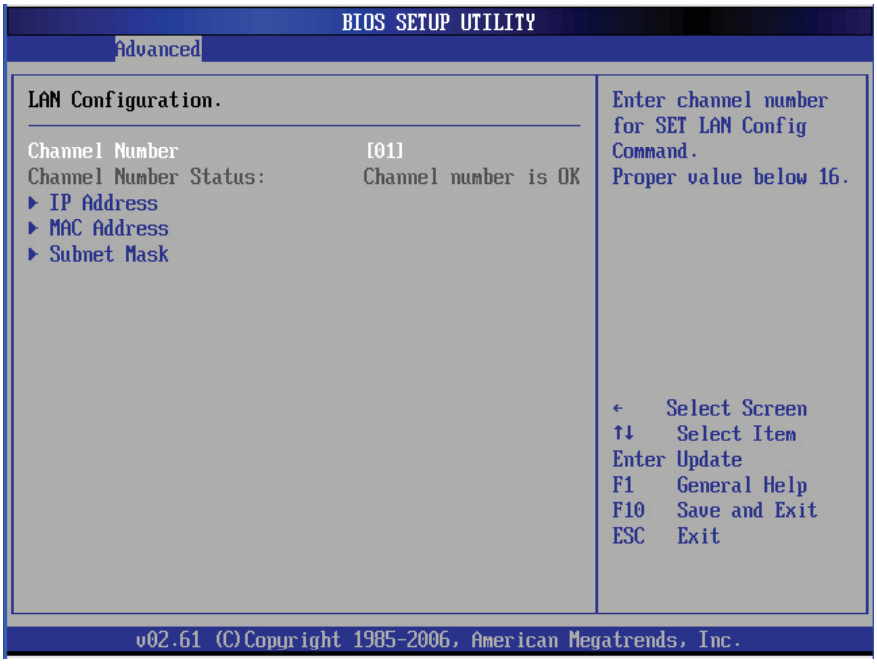
Clear BMC System Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

▶Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

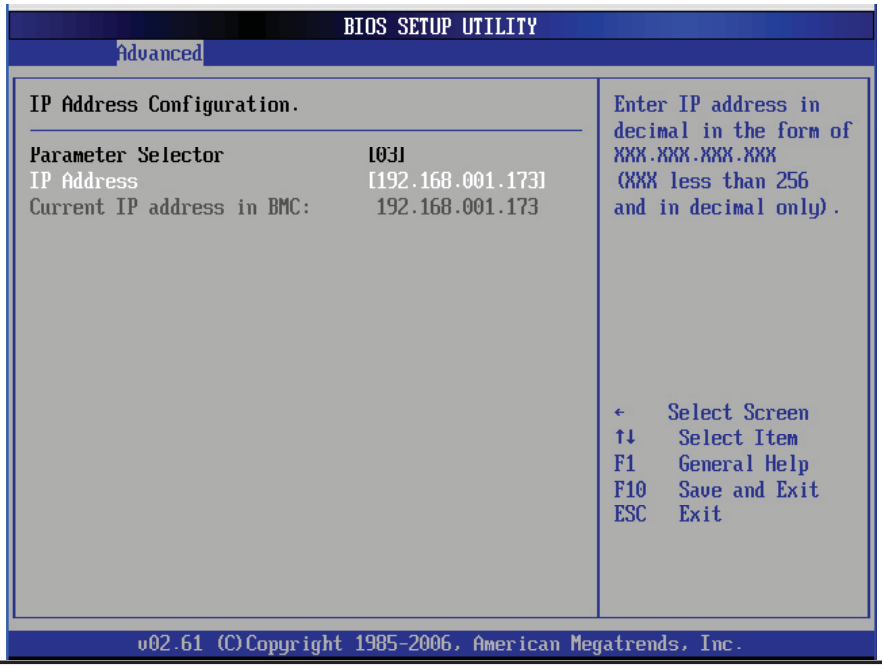


Channel Number - Enter the channel number for the SET LAN Config command. This is initially set to **[1]**. Press "+" or "-" on your keyboard to change the Channel Number.

Channel Number Status - This feature returns the channel status for the Channel Number selected above: "Channel Number is OK" or "Wrong Channel Number".

▶IP Address Configuration

Enter the IP address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255 as shown in the screen below.


BIOS SETUP UTILITY
Advanced
IP Address Configuration.
Parameter Selector [03]
IP Address [192.168.001.173]
Current IP address in BMC: 192.168.001.173
Enter IP address in decimal in the form of XXX.XXX.XXX.XXX (XXX less than 256 and in decimal only).
← Select Screen
↑↓ Select Item
F1 General Help
F10 Save and Exit
ESC Exit
v02.61 (C)Copyright 1985-2006, American Megatrends, Inc.

Parameter Selector

Use this feature to select the parameter of your IP Address configuration.

IP Address

The BIOS will automatically enter the IP address of this machine; however it may be over-ridden. IP addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

Current IP Address in BMC

This item displays the current IP address used for your IPMI connection.

▶MAC Address Configuration

Enter the Mac address for this machine. This should be in decimal and in dotted quad form (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255 as shown in the screen below.

Parameter Selector

Use this feature to select the parameter of your Mac Address configuration.

Mac Address

The BIOS will automatically enter the Mac address of this machine; however it may be over-ridden. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

Current Mac Address in BMC

This item displays the current Mac address used for your IPMI connection.

▶Subnet Mask Configuration

Subnet masks tell the network which subnet this machine belongs to. The value of each three-digit number separated by dots should not exceed 255.

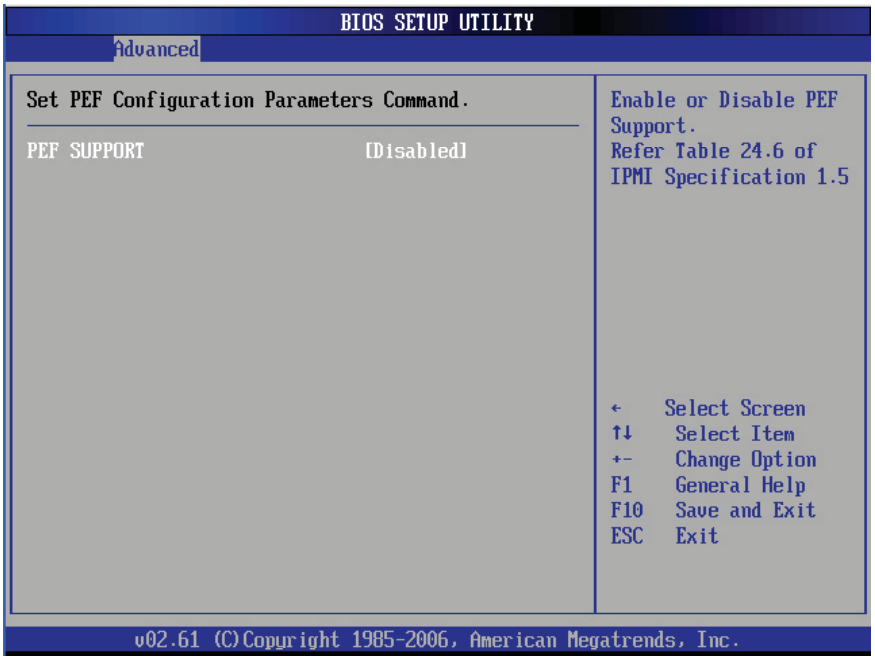
Parameter Selector

Use this feature to select the parameter of your Subnet Masks configuration.

Subnet Mask

This item displays the current subnet mask setting for your IPMI connection.

▶SEL PEF Configuration



Set PEF Configuration

Set this feature to configure the Platform Event Filter (PEF). PEF interprets BMC events and performs actions based on pre-determined settings or 'traps' under IPMI 1.5 specifications. For example, powering the system down or sending an alert when a triggering event is detected.

The following will appear if PEF Support is set to Enabled. The default is **Disabled.**

PEF Action Global Control - These are the different actions based on BMC events. The options are **Alert**, Power Down, Reset System, Power Cycle, OEM Action, Diagnostic Interface.

Alert Startup Delay - This feature inserts a delay during startup for PEF alerts. The options are Enabled and **Disabled**.

PEF Alert Startup Delay - This sets the pre-determined time to delay PEF alerts after system power-ups and resets. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **No Delay**, 30 sec, 60 sec, 1.5 min, 2.0 min.

Startup Delay - This feature enables or disables startup delay. The options are Enabled and **Disabled**.

PEF Startup Delay - This sets the pre-determined time to delay PEF after system power-ups and resets. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **No Delay**, 30 sec, 60 sec, 1.5 min, 2.0 min.

Event Message for PEF Action - This enables of disables Event Messages for PEF action. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **Disabled** and Enabled.

BMC Watch Dog Timer Action

Allows the BMC to reset or power down the system if the operating system hangs or crashes. The options are **Disabled**, Reset System, Power Down, Power Cycle.

BMC Watch Dog TimeOut [Min:Sec]

This option appears if BMC Watch Dog Timer Action (above) is enabled. This is a timed delay in minutes or seconds, before a system power down or reset after an operating system failure is detected. The options are **[5 Min]**, [1 Min], [30 Sec], and [10 Sec].

▶DMI Event Log

View Event Log

Use this option to view the System Event Log.

Mark all events as read

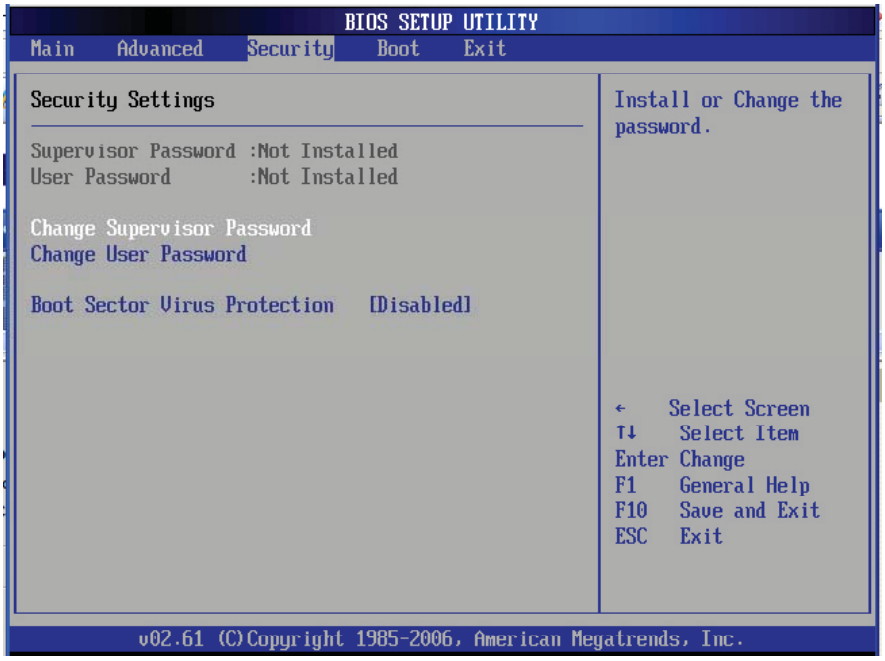
This option marks all events as read. The options are OK and Cancel.

Clear event log

This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

7-4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.



Supervisor Password

This item indicates if a Supervisor password has been entered for the system. "Not Installed" means a Supervisor password has not been used.

User Password

This item indicates if a user password has been entered for the system. "Not Installed" means that a user password has not been used.

Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then type in a new Supervisor Password.

User Access Level (Available when Supervisor Password is set as above)

Available options are **Full Access**: grants full User read and write access to the Setup Utility, View Only: allows access to the Setup Utility but the fields cannot be changed, Limited: allows only limited fields to be changed such as Date and Time, No Access: prevents User access to the Setup Utility.

Change User Password

Select this feature and press <Enter> to access the submenu , and then type in a new User Password.

Clear User Password (Available only when User Password has been set)

This item allows you to clear a user password after it has been entered.

Password Check

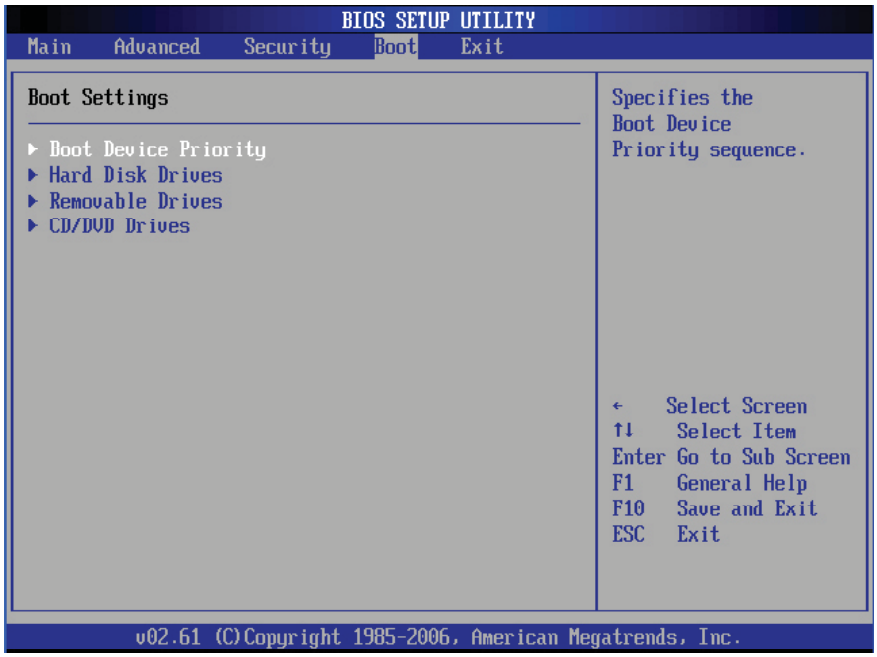
This item allows you to check a password after it has been entered. The options are **Setup** and Always.

Boot Sector Virus Protection

When Enabled, the AMI BOIS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

7-5 Boot Configuration

Use this feature to configure boot settings.



▶Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device, 5th boot device and Disabled.

- 1st Boot Device - [USB: XXXXXXXXX]
- 2nd Boot Device - [CD/DVD: XXXXXXXXX]

▶Hard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all hard disk drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc).

- 1st Drive - [SATA: XXXXXXXXX]

▶Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Drive - [USB: XXXXXXXXX]

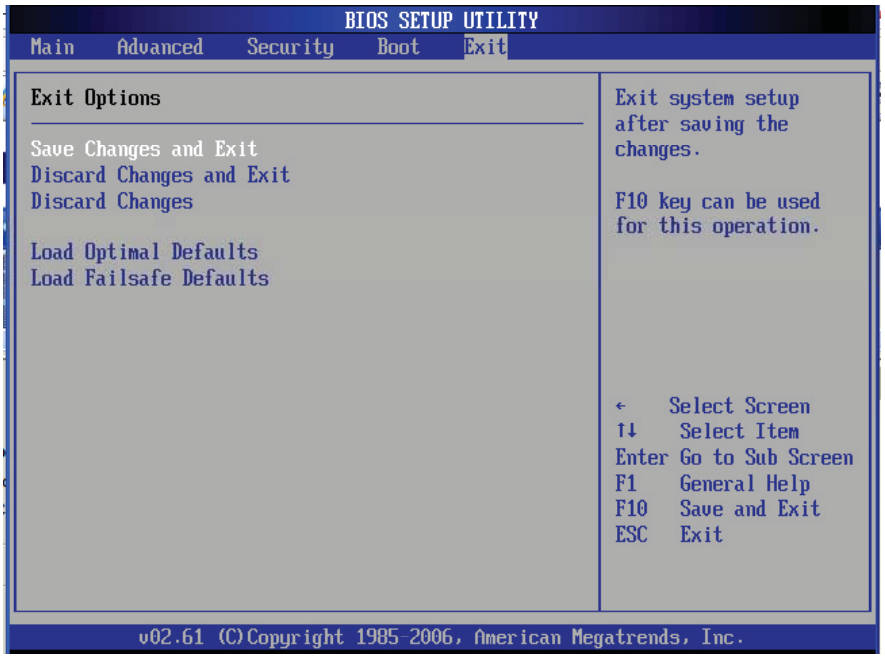
- 2nd Drive

▶CD/DVD Drives

This feature allows the user to specify the boot sequence from available CD/DVD Drives (i.e., 1st Drive, 2nd Drive, etc).

7-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit BIOS Setup screen.



Save Changes and Exit

When you have completed the system configuration changes, select this option to leave the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

Load Optimal Defaults

To set this feature, select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

A-1 BIOS Error Beep Codes

BIOS Error Beep Codes		
Beep Code	**Error Message**	**Description**
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep (with the front panel OH LED on)	System Overheat	1 continuous beep with the front panel OH LED on

Notes

Appendix B

Installing Windows

After all hardware components have been installed, you must first configure Intel South Bridge RAID Settings before you install the Windows OS and other software drivers. To configure RAID settings, please refer to RAID Configuration User Guides posted on our web site at www.supermicro.com/support/manuals.

Note: the following instructions apply to installing Windows XP or Windows 2003 only. If installing Windows 2008 or Windows Vista, please follow the instructions displayed on your screen after loading the Operating System CD.

B-1 Installing Windows for a RAID System

1. Insert Microsoft's Windows XP/Windows 2003 Setup CD in the CD drive and the system will start booting up from the CD.

2. Press the <F6> key when the message "Press F6 if you need to install a third party SCSI or RAID driver" displays.

3. When the Windows XP/Windows 2003 Setup screen appears, press "S" to specify additional device(s).

4. Insert the driver diskette "Intel AA RAID XP/2003/2008/Vista Driver for ICH10R" into the floppy drive and press the <Enter> key.

5. Choose the Intel(R) ICH10R *SATA RAID Controller* from the list indicated in the Windows setup screen and press the <Enter> key.

6. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do so at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

7. From the Windows setup screen, press the <Enter> key. The program will automatically load all device files and then continue the Windows installation.

8. After the installation is complete, the system will automatically reboot.

B-2 Installing Windows for a Non-RAID System

1. Insert Microsoft's Windows XP/Windows 2003 setup CD in the CD drive and the system will start booting up from the CD.

2. Continue with the OS installation. The Windows OS Setup screen will display.

3. From the Windows setup screen, press the <Enter> key. The XP/2003 Setup will automatically load all device files and then continue with the installation.

4. After the installation is complete, the system will automatically reboot.

5. Insert the Supermicro Setup CD that came with your system into the CD drive during the system boot, and the main screen will display.

Appendix C

System Specifications

Processors

Two Intel Xeon 5600/5500 series processors

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

Intel 5520 + ICH10R

BIOS

32 Mb AMIBIOS® SPI Flash ROM

Memory Capacity

Twelve DIMM sockets supporting up to 192 GB of registered ECC DDR3-1333/1066/800 SDRAM or up to 48 GB of unbuffered ECC/non-ECC DDR3-1333/1066/800 MHz SDRAM

Note: See the memory section in Chapter 5 for details.

GPUs (Graphics Processing Units)

6016XT-TF/6016GT-TF: GPU-ready (no GPUs installed)
6016GT-TF-TM2: two NVIDIA Tesla M1060 GPU cards
6016GT-TF-TC2: two NVIDIA Tesla C1060 GPU cards

SATA Controller

Intel on-chip controller for 3 Gb/s SATA (RAID 0, 1, 10 and 5 support)

Drive Bays

Three hot-swap drive bays to house three standard SATA drives

Expansion Slots

6016XT-TF: four standard size PCI-E x8 cards (in x16 slots), one low-profile PCI-E x4 card (in x16 slot)
6016GT-TF: two standard size PCI-E x16 cards, one low-profile PCI-E x4 card (in x16 slot)
6016GT-TF-TM2: one low-profile PCI-E x4 card
6016GT-TF-TC2: one low-profile PCI-E x4 card

Serverboard
X8DTG-DF (proprietary ATX form factor)
Dimensions: 16.64" x 7.74" (423 x 197 mm)

Chassis
SC818GTQ-1400B (1U rackmount)
Dimensions: (WxHxD) 17.2 x 1.7 x 28.2 in. (437 x 43 x 716 mm)

Weight
Gross (Bare Bone): 47 lbs. (21.4 kg.)

System Cooling
Four sets of 4-cm counter-rotating cooling fans (fan speed controlled by BIOS setting) and two sets of 4-cm counter-rotating cooling fans for GPUs (6016GT series only)

System Input Requirements
AC Input Voltage: 180-240 VAC
Rated Input Current: 7.2A (180V) to 9.5 (240V)
Rated Input Frequency: 50-60 Hz

Power Supply
Rated Output Power: 1400W w/PFC (Part# PWS-1K41F-1R)
Rated Output Voltages: +12V (117A), +5Vsb (6A)

Operating Environment
Operating Temperature: 10º to 35º C (50º to 95º F)
Non-Operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-Operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance
Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

(continued from front)

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